THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXIV. No. 600.] LONDON, NOVEMBER 10, 1874. [26TH YEAR.] Price 6d.

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COAL. Analysis—10,000 cubic feet of gas per ton of coal: 26-candle gas; 13¼ cwt. coke per ton of coal.
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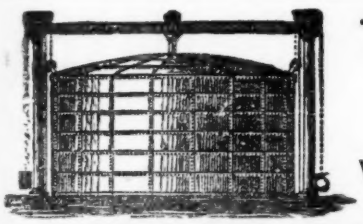

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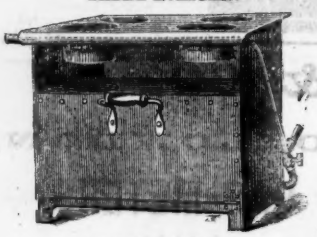
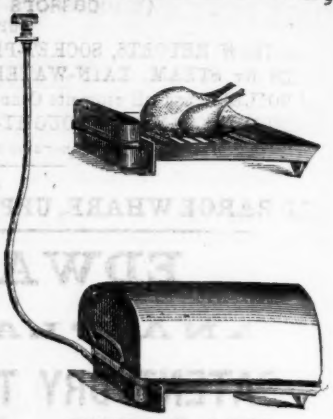


SMALL RANGE.

LARGE RANGE.



ROASTERS, Nos. 1, 2, & 3.

ON SOUTHBY'S PATENT, WHICH SECURES PERFECT VENTILATION.

A 7-lb. JOINT ROASTED TO PERFECTION FOR ONE HALFPENNY.

SELECTED BY THE COMMISSIONERS FOR THE ANNUAL INTERNATIONAL EXHIBITIONS, 1871 & 1873.

A pennyworth of gas, perfectly consumed and economized as it is under this Patent, does as much work as six pennyworth of coal. The peculiar arrangement of cannel fishtails in a chimney secures freedom from smoke even with the richest gas, and a positive immunity from every trace of smell. The simplicity in use is so great that no experience is required. Roasters from 12s. 6d. to £1 5s. Complete Ranges at £2 4s. for small families; £3 10s. for ordinary establishments; and £6 6s. for a Range equal in power to a large Kitchener. Estimates given for fitting up Hotels, Restaurants, and large Establishments.

Works: 2, BASSETT STREET, MALDON ROAD, KENTISH TOWN, N.W.,

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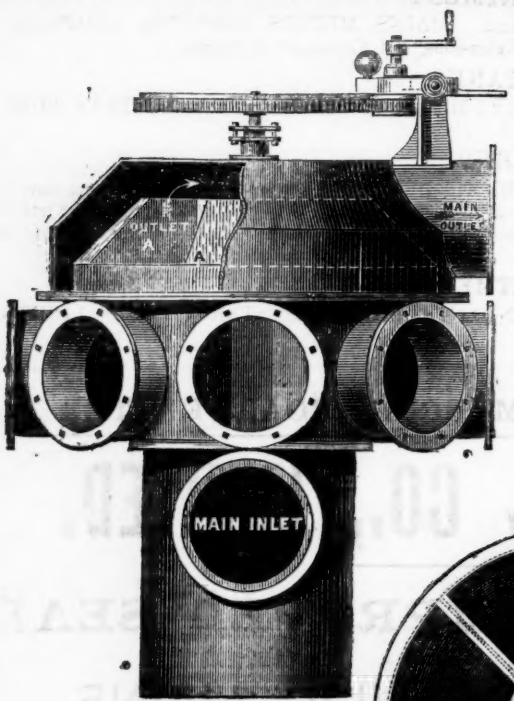
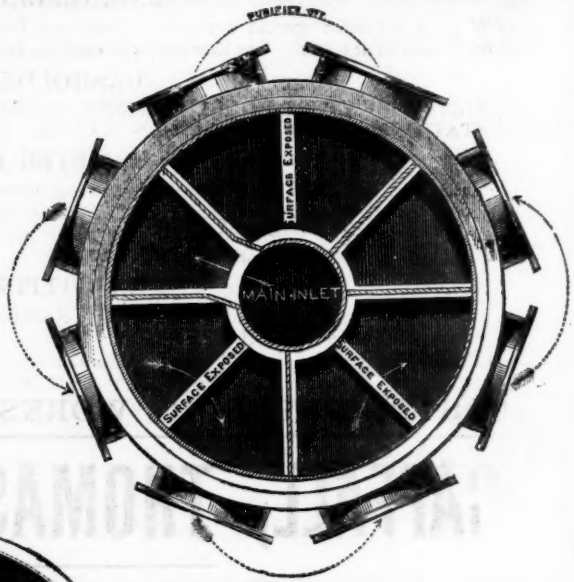
And at Mr. WOODCOCK'S Offices, 23, ABINGDON STREET, WESTMINSTER, where Mr. SOUTHBY can be consulted by appointment.

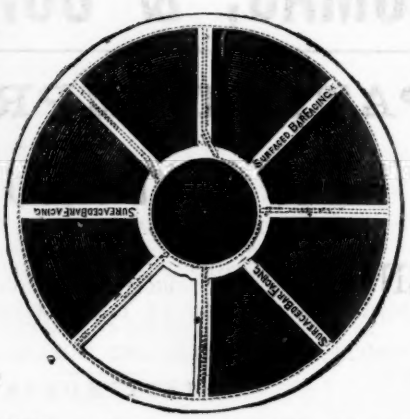
C. & W. WALKERS' PATENT CENTRE-VALVES.



Elevation of the Centre-Valve for four Purifiers. The safety cover is shown broken, to enable the Valve itself, which is inside, to be seen.



Plan of the Body, showing the Valve lying in it, with three of the facings, which were formerly exposed to settlements of dirt, carbon, naphthaline, &c., but which are now always covered by the surfaced bar-facings of the Valve. (See below.)



Plan of the Valve, or upper portion, showing the surfaced bar-facings referred to above.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A very considerable improvement and saving is effected in the cost of the connecting-pipes.

FOUR-WAY CENTRE-VALVES FORMING INLET, OUTLET, AND BYE-PASS.

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SUPPLY FROM STOCK

CAST-IRON RETORTS, SOCKET-PIPES for GAS or WATER PURPOSES, FLANGE-PIPES for STEAM, RAIN-WATER PIPES and GUTTERS, HOT-WATER PIPES and BOILERS, and all requisite Connexions for same; also LAMP-COLUMNS, LAMPS, WROUGHT FRAMES, WROUGHT-IRON TUBING, &c., &c.

All kinds of Gas-Works Apparatus and General Castings made to Pattern or Drawing.

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IS STRONG, SIMPLE, EASILY FIXED AND WORKED, AND THOROUGHLY EFFICIENT AT ALL TIMES.

TESTIMONIAL.

Gas-Works, Guildford, Sept. 15, 1874.

GENTLEMEN,—The five retorts fitted with your Patent Moveable Seal for Dip-Pipes, on June 30, have been in constant use since that date, and have worked in a most satisfactory manner.

These Retorts are still quite clean and free from carbon, whilst others not so fitted, after being at work eight weeks, required scurfing, having a deposit of carbon 2 inches in thickness on the inside.

I also find a slight increase in the yield of gas per ton of coal carbonized, although your Patent Seals are fitted to but one-fifth of the Retorts now at work.

As your statements respecting your apparatus are fully confirmed by the results obtained in practical working, I should wish you at once to fix one to each of the ovens at these works, that I may obtain all possible advantage during the coming winter.

Yours truly,

Messrs. Caffall, Thomas, and Co., Limited, 28, Gracechurch Street, E.C. JOS. SHAW, Manager.

MODELS MAY BE SEEN, AND INFORMATION OBTAINED, AT THE OFFICES, 28, GRACECHURCH STREET.

OXIDE OF IRON.—We are prepared to supply, on moderate terms, HYDRATED PEROXIDE OF IRON (IRON OCHRE), Same quality as supplied by us to several of the most extensive Gas Companies, and which has given entire satisfaction.
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SOLE AGENT FOR
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FOR REMOVING THE
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For excellence of Fire-Clay Gas Retorts, and
"HONOURABLE MENTION" for
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BLAST-FURNACE, & TANK BRICKS, LUMPS, TILES,
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GAS-PURIFYING WOOD SIEVES,
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It requires but one trial to prove the Superior Make, Strength, and Durability of these Sieves.

CATHELS'S Patent District Dry Gas-GOVERNOR is the only perfect self-acting contrivance for Regulating the Pressures in the higher levels of a district.
For prices, &c., apply to the Manufacturers, Messrs. GUEST AND CHRIMES, ROTHERHAM.

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LAMP METERS AND BOXES,
GOVERNORS, GAUGES, INDICATORS, EXHAUST & PRESSURE REGISTERS,
GAS STATION-METERS,
With all the joints planed.
TERMS, &c., ON APPLICATION.

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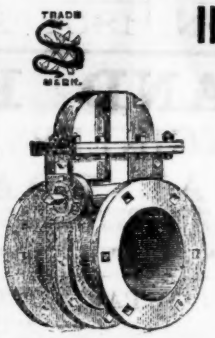
IMPROVED GAS-VALVES
WITH WROUGHT-IRON PINIONS,

List of prices, with full dimensions of all sizes up to 48-inch, to be had on application.
These Valves are all proved on both sides to 30 lbs. on the square inch before leaving the works, and are always kept in stock.
VALVES MADE WITH OUTSIDE RACKS TO ORDER.
ALSO, SCREW WATER-VALVES WITH GUN-METAL FACES.
ALSO SOLE MAKERS OF
J. BEALE'S NEW PATENT GAS EXHAUSTERS.
B. DONKIN & CO.,
GENERAL ENGINEERS AND IRONFOUNDERS,
MAKERS OF STEAM-ENGINES,
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THE PATENT
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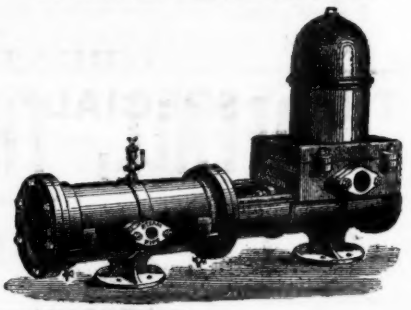

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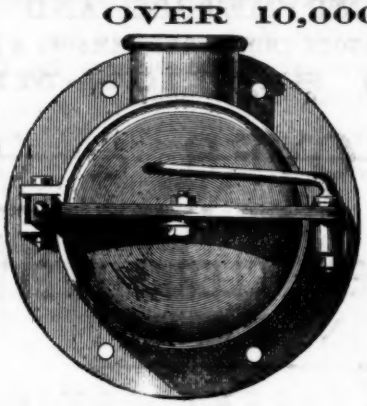

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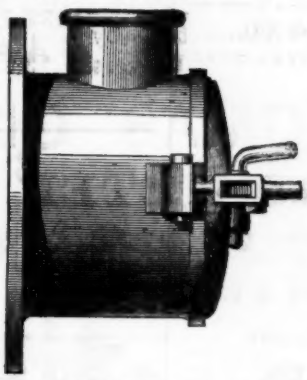

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„ London Gaslight Company.	„ Gas-Works, Arsenal, Woolwich.	„ Liverpool United Gas-Works.	„ Ystrad Gas-Works.
„ Independent Gaslight Company.	„ Commercial Gas Company.	„ Birkenhead Gas-Works.	„ St. Alban's Gas-Works.
„ Phœnix Gaslight Company.	„ Alliance and Dublin Gas-Works.	„ Birmingham Gas-Works.	„ Over Darwen Gas-Works.
„ South Metropolitan Gaslight Co.	„ Edinburgh Gas-Works.	„ Nottingham Gas-Works.	„ Aylesbury Gas-Works.
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6*	3	12	2,200	25
4	4	12	3,900	25
6*	4	12	3,900	30
6	5	12	6,100	35
7*	5	12	6,100	40
6	6	12	8,800	40
8*	6	12	8,800	50
7	7	12	11,900	50
10	7	12	11,900	65
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10	8	18	15,660	75
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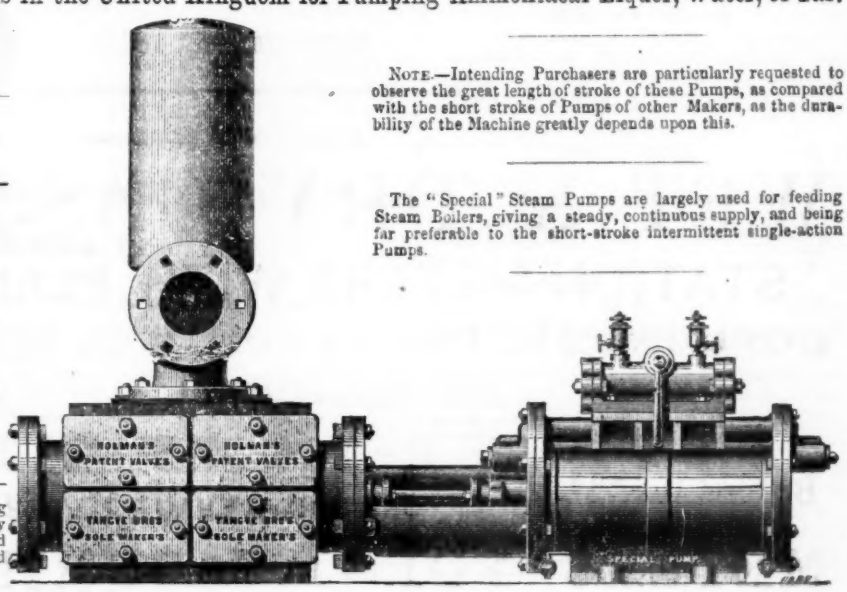

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The latter being the Highest Medal awarded for Dry Gas-Meters by the Imperial Commissioners for the Universal Exhibition, Paris, 1867.

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THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

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(SUCCESSORS TO SAMUEL CROSLEY,)

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STREET-LAMP METERS,

AND REGULATORS FOR AVERAGE METER INDICATION.

METERS FOR MEASURING WATER.

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TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

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THE JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, NOVEMBER 10, 1874.

Circular to Gas Companies.

The proceedings at the last meeting of the Metropolitan Board of Works, which we report at length in another column, bring us face to face with the Board on the gas question. Except on one particular, which will presently be noticed, we are now fully informed of the intentions of the Board, and may here shortly review the position. The original resolution of the Board, our readers will remember, committed them to nothing more than an application to Parliament for power to start competing gas-works, or, as the resolution said, power to "furnish an "independent supply of gas." They have since taken the opinion of parliamentary agents and others, and, in accordance with advice received, have now resolved to go before Parliament with three alternative proposals, to be embodied in three separate Bills. One is the Bill originally resolved upon, which is to obtain power to supply gas in competition with the companies; another is to enable the Board to acquire the property of the companies; and by the third the Board will seek to fix upon all the metropolitan gas companies an improved and uniform system of regulations. By this mode of procedure it will be seen that the Board have provided a maximum amount of work for parliamentary agents, draftsmen, engineers, and others, and have so far made it certain that, whatever benefit the metropolitan gas consumer may obtain by the proceedings (if, indeed, he get any), it shall be secured at the greatest possible charge to the ratepayers. This matter will not escape the attention of the vestries who, like that of St. George-the-Martyr, are opposed to the proceedings of the Metropolitan Board.

We may proceed to consider what the actual proposals of the three Bills may be. The report of the proceedings at the meeting of the Board, which we print elsewhere, shows that they have been advised that the cost of competing works will amount to about £6,000,000. This estimate is, of course, nothing but a guess, and we strongly recommend the Board to apply for power to raise a considerably larger sum of money. The scheme submitted to the Board, and to be embodied in their Bill, is, so far as we can gather, somewhat as follows:—It proposes to establish three gigantic gas-works, two on the north of the Thames, and one on the south. One of those on the north side, and the largest suggested, it is proposed to construct close by the northern sewage outfall, at which the Metropolitan Board have a small area of vacant land; but as this will be utterly insufficient for the purpose of the works, it will be necessary for the Board to purchase a hundred or two other acres, which we shall find, in time, duly scheduled. The works projected for the supply of the whole of the metropolitan area south of the river it is proposed to locate near the southern sewage outfall, where also the Board have a little land, but not nearly enough space for the erection of works of the magnitude required. The site suggested for the western works is, we understand, somewhere in the neighbourhood of Wormwood Scrubs. In addition to these manufacturing stations, the necessity of storeage works is admitted; and it is proposed to scatter these about—east, west, north, and south—on sites not yet, we believe, selected, but of which we shall presently be informed. Altogether we may estimate, or rather guess, that the scheme will necessitate an application for powers to take some 600 or 700 acres of land. That is the first cost to be incurred, and, considering what land now fetches in and around the metropolis, this first expense will be seen to be of some importance. Then will come the erection of works and the laying down of distributing plant. As regards these, we confidently state that at the present day the cost of materials and work will necessitate a larger expenditure than has been incurred by the gas companies, most of whose work has been done on terms unknown to-day. While they are about it, the Board may just as well apply for £10,000,000.

As regards the location of these several manufacturing stations, a point strikes us which may be of interest to the metropolitan ratepayer. The two principal works are, we rather think, outside the area of the coal duties, and therefore about three-fourths of the coal used would contribute nothing to the metropolitan rates. Then it is proposed to utilize the sewer embankments as pipe tracks, and as these are the private property of the Board no advantage would accrue to the parishes for the profitable occupation of the soil contemplated.

We passed over just now one consideration which may as well be stated. We gather from Mr. Leslie's speech that the competition is not directed merely against what we may call the really metropolitan gas companies, whose districts are wholly included within the area of the Board. There are eight other companies whose limits penetrate this area, and they would necessarily be subjected to a partial competition if the Board succeeded in accomplishing their proposed object. These will, of course, combine with the other companies for the protection of common rights, and then we shall have a compact phalanx opposed to the pretensions of the Board.

In the above remarks we have spoken of this scheme as if it was a serious proposal. It is no such thing. Not one member of the Board thinks it will be, not one desires that it should be carried; and the elaborate preparations made for its presentation to Parliament are simply a disgraceful, a reckless, a wilful squandering of public money for which the Board will certainly some day be called to account. We pass to the alternative proposals.

The first of these is the acquisition of the property of the gas companies. Now, this is a perfectly legitimate object, and one which, if brought forward seriously and in good faith, the Legislature would be certain to entertain. The Board have recently been told, on better authority than ours, that they may have the works at any time if they will pay a proper price for them. What that price is it is not for us to say; but some inkling of it may be obtained from a speech by Mr. Denison on the Neath Bills, which reaches us opportunely, and which we publish to-day. It is said that the metropolitan ratepayers would not consent to the expenditure of the large sum required for the purchase of the companies. We doubt this; but if it is a fact, they will certainly never acquiesce in the competition scheme. In the one case the

sum expended, huge as it may appear, might bring a profitable return; in the other, the money might just as well be thrown down the sewers; not so, however, for the expenditure would every year involve the Board in a loss which must be made good by the unfortunate ratepayer. Our opinion is that the Board could not do better than purchase the works. We doubt whether the metropolitan gas consumer would be benefited, and we contend that the ratepayer ought not to be relieved; but we are certain that the acquisition would involve the Board in no loss. We need, however, indulge in no speculations on this part of the question. The Board are no more serious in this than in the previously mentioned application.

We come next to what we believe to be the really earnest proposal, "the application to all the companies of an improved "and uniform system of regulations." What the improved and uniform system desired by the Board may be, we must wait to learn. The only thing suggested in the speech of Mr. Richardson is an uniform dividend of 6 per cent. Now, that is confiscation which Parliament will never sanction, and with this remark we may dismiss that part of the question. If we inquire further, we have to refer to recent legislation. The Metropolitan Gas Acts, 1868-1869, occupied much of the time of the Legislature. The conclusion arrived at was to institute a most rigid control over the three companies concerned. Their accounts were to be strictly audited, their gas was to be rigorously tested, and their plan of manufacture was to be carefully supervised. The companies were bound to supply a high quality of gas, and they were saddled with a low maximum price. At the same time the revision clauses were inserted, under circumstances which Mr. Phillips has recently explained in our columns. The regulations so imposed only affect three of the metropolitan gas companies, and it is perfectly competent for the Metropolitan Board to seek to fix them on all the companies within their district. Gas of the uniform quality of 14 candles we have always advocated for the metropolis, and, the revision clauses granted, we do not object to the price of 3s. 6d. per 1000. For this the Board may work, and probably with success, but if they attempt more they will certainly fail. Should they, for example, seek to expunge the revision clauses, what would their chance of success be? In 1868 there was no "coal famine," and none anticipated. Everything looked fair for years to come. But is it likely that with the experience of the eventful years 1872–1873, the Legislature would inexorably tie down the gas companies to a low maximum price? The conditions obtaining in the years we have mentioned may be at any time repeated, and will, we hope, for the sake of the whole nation, be often repeated; and is it likely that Parliament will agree to any proposal which, at a time of otherwise general prosperity, would condemn an important industry to be carried on at a loss? We know they would not. What the Metropolitan Board may reasonably expect to succeed in is simply this—to get the *public* provisions of the South Metropolitan and Imperial Companies Acts, 1869, applied to all the companies. That, the Legislature will no doubt consent to; but if any attempt be made to interfere with the established and equitable rights of the companies we are certain it will fail.

What course will be taken by the Corporation of the City of London we are not yet informed. Whether they also promote three Bills, or whether they content themselves with giving their "cordial co-operation" in promotion of the Board's measures, is a matter of little consequence to us. The gas companies are fully prepared for the attack or attacks, certain of the results which will follow. The worst of these is the enormous expense to which the companies will be put, and which, as Mr. Leslie says, can only delay a reduction in the price of gas.

Before quitting this subject of the meeting of the Metropolitan Board, we feel bound to offer a remark, which we make with some reluctance. Criticisms on the conduct of a company under the Act of 1868, who are bound to supply 16-candle gas for 3s. 9d., if they cannot, after full inquiry, obtain a higher price, come with a very bad grace from the chairman of a company under the Act of 1860, who might if they chose supply 12-candle gas at 4s. 6d. (if not 5s. 6d.) per 1000 feet. The increase obtained by the Chartered Company, after a searching and costly investigation, could have been made in the board-room of the Commercial Company, and probably we are not wrong in believing it would have been made, but for the large reserve-fund accumulated. The Chartered Company, with no reserve-fund, and tied to a low maximum price, were bound to avail themselves of the revision clauses of the City of London Gas Act, 1868. We have always contended that the Act of 1860 offered sufficient guarantees to both consumers and companies, and we should have been satisfied if it had been let alone. At the same time we admit that the Act of 1868 was calculated to, and did actually benefit the consumers in the City, and but for the disturbance in the coal market, would have continued to do so. The Act of 1868 was not sought by, the circumstances which subsequently arose could not be controlled by, the Chartered Company; and, in availing themselves of the revision clauses, this company only did, with authority, what the Commercial might have done of their own mere motion.

It is dangerous to play the part of a prophet, but if we are asked what is likely to be the upshot of all this agitation, we may repeat our belief that it will simply be the extension of the legislation of 1869 to all the metropolitan companies.

There is nothing so much to be deprecated as the introduction of political feelings into purely municipal matters. The object of a municipal election should be to obtain the best men of business for the management of local affairs. Unfortunately, we see year by year the political test being more and more applied to candidates, until we find, as to-day, in almost every Town Council, parties as opposed as in the House of Commons. The result is much loud talk, great obstruction to business, and not unfrequently virulent personal attacks on well-deserving people. In the Rochdale Town Council, for example, party feeling runs high, and finds its vent in attacking the gas management. The Rochdale undertaking is not managed financially on the principles we admire. The council insist on profits to keep down rates, and therefore the gas is not cheap. Burnley is pointed to as a place in which gas is much cheaper; but it is not pointed out, at the same time, that the gas is of a considerably inferior quality. Nor is it mentioned that meter-rents are exorbitantly high in Burnley, nor that the Corporation of that borough get as much for lighting 640 public lamps as Rochdale charges for more than twice the number. The fact appears to be that the Gas Committee of Burnley have devoted themselves (and they are to be commended for it) to the accumulation of capital, so that they have now no less a sum than £59,000 on which they pay no interest. Since 1855 they have paid over for public improvements £15,872 only, while the Rochdale undertaking has contributed to the same objects £65,213. Thus at Burnley the gas consumer is the first consideration, and then the ratepayer. At Rochdale the interest of the ratepayer is first considered, and the gas consumer pays accordingly. We hope to see Rochdale reform its system, but the improvement is not likely to be hastened by incessant bickerings, dictated by political prejudices.

We publish in to-day's issue the gas accounts of the Corporation of Manchester; but any comments which may be suggested by a study of them must be deferred until our next.

Water and Sanitary Notes.

A SIMULTANEOUS outbreak of typhoid fever, at two places so differently circumstanced as Over Darwen and Lewes, offers a problem which it is most important that our sanitary authorities should do their utmost to solve. Allowing for the natural exaggerations of an enthusiastic sanitarian (new, we rather think, to official work), we may accept it as a fact that Over Darwen is a town reeking with filth, full of overcrowded houses, and with a deficient and impure water supply. No one hesitates to assign the efficient cause of fever there. Lewes, however, has been recently drained and sewered, the most careful attention having been paid to the ventilation of the sewers. It is furnished, moreover, with an excellent supply of wholesome water. What can be the cause of fever in such a place? That is what we wish our sanitary authorities to carefully and candidly investigate. The medical mind is pre-eminently reverential. The opinions or dogmas of a leading sanitary authority—say that of the medical officer of the Privy Council—are received by ordinary medical men with as much faith as the Vatican decrees are by Ultramontanists. If cholera breaks out, the doctor is told to look into the water supply for the cause of it, and he always finds it there. If typhoid occurs, sewer or cesspool emanations, contaminating air and water, must be looked for; and, as a rule, they are found. This outbreak at Lewes, then, comes opportunely as a caution against hasty conclusions and generalization. It is clear that we have still to ascertain the true factor in the production of typhoid fever. Let it not be supposed that we belong to what is called the "dirt party." We regard the alleged condition of Over Darwen as a disgrace to the local authority, by a strange misnomer called a Board of Health. Let Over Darwen be cleansed and drained like Lewes, and have water reservoirs far removed from cesspools; but let it be well understood that this will not necessarily imply the complete prevention of typhoid.

The Town Council of Rochdale are about to apply to Parliament for power to raise £170,000, mainly for the extension of their water undertaking; for it seems that at the present time the town is dependent on some private individuals for a great part of its supply of water.

The Town Council of Swansea and the Local Government Board have been in dispute, and the council have obtained a partial advantage. The council want to complete the sewerage of the town, and to extend and improve their water-works; but the Corporation are awfully in debt, and they wished to raise the

necessary funds at the lowest possible rate of interest. They therefore applied to the central authority to sanction a loan from the Public Works Loan Commissioners, and got a refusal. They persevered, however, and seem now to have obtained permission to borrow the money necessary for the sewerage works at 3½ per cent., but are still refused the money necessary for the water-works. No reasons for the refusal are assigned, but we may conjecture that the Local Government Board regard water-works in the light of commercial undertakings, and, therefore, think that the Town Council of Swansea, like other commercial men, may go into the open market for their money. If it be so, we think the central authority are right.

Manchester is going to Parliament for power to extend their water-works, and for what is almost of equal importance—for authority to cleanse and improve the river Medlock.

At an influential meeting in Gateshead, it was resolved—"That "a joint committee be appointed from the Corporations of New-"castle, Gateshead, Tynemouth, and other sanitary authorities in "South Northumberland and the North of Durham, to inquire "into the question of the water supply, and to recommend such "immediate steps as they may deem necessary to a future "meeting." The chairman of the Newcastle and Gateshead Water Company attended the meeting in an unofficial character, and made a very sensible defence for his company, whose additional works now in progress will, no doubt, in time, furnish an adequate supply. We see with some astonishment that in Gateshead the Ulswater scheme finds some favour, the projector of which sets down its cost at a million for a supply of 40 millions of gallons per day. To the above sum must be added £600,000 for the purchase of the Newcastle and Gateshead Water Company. An innocent town councillor appeared to think that all this money could be borrowed from the Public Works Loan Commissioners at 3½ per cent. Let him go to Swansea and estimate his chances of getting it.

GAS LEGISLATION IN 1874.

In the last session of Parliament, only two Acts for the incorporation of gas companies, hitherto without statutory powers, were passed.

1. The *Enniskillen Gas Act* incorporated a company formed to purchase the private undertaking of Messrs. Malam and Co., the limits of supply being the borough of Enniskillen. The capital of the company is £16,000, with power to borrow £4000 on the usual conditions. The maximum price of gas is not to exceed 8s. per 1000, the minimum illuminating power being 14 candles, tested by the new "London" burner, No. 1, with chimney according to circumstances. Provision is made for the sale of the undertaking to the Town Commissioners of Enniskillen, if they give notice within twelve months of the passing of this Act, the consideration being fixed at 16⅔ years purchase of the average net profits of the years 1872, 1873. Any dispute arising is to be settled by Mr. R. P. Spice and Mr. G. W. Stevenson, or an umpire appointed by them. All necessary provisions are made for the transference of the undertaking to the company, and prospectively for the conveyance to the commissioners, and the consequent winding up of the company.

2. The *Grantham Gas Act* incorporates with statutory powers the Grantham Gaslight and Coke Company, hitherto existing under a deed of settlement. The capital of the old company is £25,000, in £20 shares, all fully paid, and £2000 have been borrowed on debentures. The new company have power to raise £15,000 additional, the dividend on which is limited to the usual extent—viz., 7 per cent. if ordinary, and 6 per cent. if preference capital. Usual borrowing powers in respect of both old and new capital have been granted under the customary restrictions. Gas of 14-candle power, tested by the new "London" burner, is to be supplied, at the maximum rate of 6s. per 1000 feet. For the rest, the Act confers all the powers and privileges usually granted to a gas company, imposing at the same time all the customary restrictions.

The Acts conferring additional powers on gas companies already possessed of statutory authorities are five number.

The *Aberdare and Aberaman Gas Act* puts an end to a long struggle, by enabling the Aberdare and Aberaman Consumers Gas Company to purchase the undertaking of the Aberdare Gas Company, supplying parts of the district without parliamentary sanction. The consideration to be paid by the former for the latter is £5500, a mortgage debt of £3000 being taken over. The purchase-money is to be paid by the creation of £10 shares issued to the directors of the selling company. The original capital of the Aberdare and Aberaman Company is £30,000, about one-third of which has been paid up. The present Act, as we read it, will empower the company to raise an additional capital of £10,000, irrespective of the £5500 to be created and issued as consideration for the purchase of the Aberdare Company. On both original and new capital the usual borrowing power is granted on the ordinary terms. The dividend on the additional capital (which we infer does not include the purchase-money of the company above mentioned) is limited, as usual, to 6 per cent. or 7 per cent., according as the shares are ordinary or preference. It is provided here, as in Acts to be hereafter mentioned, that if the net profits applicable to dividend are insufficient to pay the maximum rate, there shall be made a rateable reduction in the dividend of each class of shares. The maximum price for gas, as fixed by the company's Act, 1869, having, from divers causes beyond the control of the company, been found too low to give a remunerative return on the capital expended, such price is, by this Act, raised to 5s. per 1000, the illuminating power being fixed at 14 candles, tested by the new "London" burner, No. 1. The gas is to be free from sulphuretted hydrogen, and the pressure at which it is to be supplied is not to be less than 6-10ths from midnight to sunset, and 8-10ths from sunset to midnight, tested, as usual, at the main, but two hours previous notice must be given to the company of the time and place at which the testing will be conducted. As regards a number of places comprised within the company's limits, it is enacted that the company shall supply any one or all of them with gas, provided that notice be given by at least 20 occupiers of houses in the place the company are required to light, each being rated to the poor at not less than £10, who every one agree to take and pay for not less than 5000 feet of gas per year for two successive years. After receipt of such notice, the company are to give a supply in six months, or forfeit not more than £10 per month.

The *Alliance and Dublin Gas Act* empowers the Dublin and Alliance Company to raise £50,000 additional capital, in respect of which the usual borrowing power is granted. The primary feature of the Act is, however, the repeal of parts of the company's Act, 1871, and the reduction of the illuminating power of the gas supplied from 20 to 16 candles. In consequence of this change, the Act provides that the company shall furnish consumers gratis with burners suitable for the consumption of the lower quality of gas, and readjust the governors of street-lamps metered and unmetered. For two years, from July 1, 1874, the maximum price of gas is to be 5s. 4d. per 1000, thenceforward it is to be 5s., subject to revision. If after July 1, 1876, the company represent to the Board of Trade that the last-mentioned maximum rate is inadequate or unremunerative, thereupon a public investigation is to be held, after which the Board of Trade may, if they think fit, authorize the substitution of a higher maximum. A flat-flame burner is retained as the test burner for the 16-candle gas. It is, however, provided that after 1877 the Corporation of Dublin and a body of consumers, whose aggregate yearly rental is not less than £25,000, may request a supply of 14-candle gas at a reduction of 8d. per 1000 feet below the maximum price authorized by this Act. If such gas be supplied, the test burner is to be the new "London" Argand, or such other burner as may from time to time be approved by the London gas referees for testing 14-candle gas. An auditor of the company's accounts is to be appointed by the Board of Trade, and so is a public gas examiner. The latter is to be paid by the company; we do not see who is to pay the former. The public examiner is to report on the quality of the company's gas once a week, but his reports are not to expose the company to penalties. The privilege of fining the gas company is to remain with the Corporation examiner. There are two other provisions which deserve notice; one is that the company, as soon as they commence the supply of the lower quality of gas, shall make to all *public bodies and companies* having a just and equitable claim thereto, either by way of reduction in the price stipulated to be paid, or increase in the quantity of gas stipulated to be supplied, such allowances as will represent the difference in the value of the gas supplied and that contracted for. The next section but one provides that nothing in the Act shall alter the price named in any existing contract with a private consumer. The Act gives the company power to purchase and work collier ships, steamers, and lighters, for the economical working of their undertaking.

The *Llanelly Gas Act* repeals the Llanelly Gaslight Company's Act, passed in the 5th year of William IV., and reconstitutes the company with extended limits and enlarged capital. They started with a capital of £3000 and a borrowing power of £2000. They have expended on their undertaking sums amounting to £21,640. This Act fixes the capital of the company at £50,000, in shares of £20 each. One hundred and fifty of such shares will represent the original capital. Of the remainder, 630 shares will be allotted rateably to the proprietors in respect of expended profits, and these will be called A shares; the others to be issued will be designated B shares. The company have a debt of £3924, which they are to pay off by the immediate issue of shares; and on these, if they are issued with a fixed and preferential dividend, the dividend is not to exceed 5 per cent. With this reservation, the net profits are to be divided as follows:—1. In payment of

5 per cent. on all classes of shares. 2. In payment of a further 2 per cent. on original shares and new shares, class B. 3. In payment of a further dividend of 3 per cent. on original shares. The Act grants the usual borrowing powers to the company, and confers all the customary privileges. The price of gas is not to exceed 5s. 6d. per 1000 within the parliamentary borough of Llanelly, and 7s. beyond those limits. Public lamps are to be charged for at a price not exceeding the lowest rate charged to a private consumer within the same limits. The pressure is to be 5-10ths from midnight to sunset, and one inch from sunset to midnight; but here, again, two hours notice of the testing is to be given. The illuminating power of the gas is to equal 14 candles, tested by the new "London" Argand, No. 1. It is provided that the Local Board of Health of Llanelly may purchase the undertaking, by agreement or on arbitration, within seven years of the passing of this Act.

The *Peterborough Gas Act* authorizes the purchase of land for new works, and, necessarily, empowers the company to raise additional capital. By the Peterborough Gas Act, 1868, the capital of the company was fixed at £30,000, with the usual borrowing power; and very nearly all the capital has been raised and expended, and the borrowing power is almost exhausted. The present Act authorizes the company to raise £50,000 additional capital, in respect of which they have the usual borrowing power, with the customary restrictions. The dividend on this new capital is limited to 6 per cent. or 7 per cent., according as the shares are preference or ordinary. The price of gas within the town of Peterborough and within a radius of one mile from the centre of the market-place is not to exceed 5s., nor outside such radius 6s. 6d., but the charge for public lamps within the municipal limits is not to exceed 5s. per 1000 feet. The test burner is to be one approved by the Board of Trade or the London Argand, No. 1. We may mention here shortly that this and all the previously noticed Acts require the payment of interest at the rate of 5 per cent. on money deposited as security.

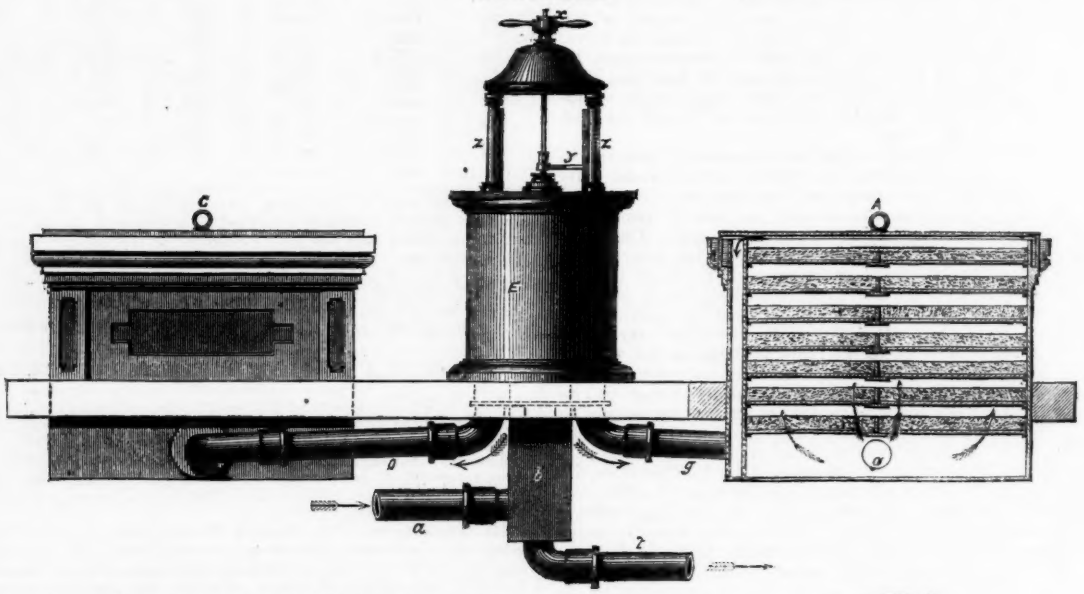
The *Ystrad Gas and Water Company's Act* is somewhat peculiar. The company obtained an Act of Incorporation in 1868, which, as regards the gas supply, seems to have imposed conditions impossible of fulfilment. The price of gas was made to depend on the quantity consumed, and varied from 4s. to 6s. per 1000, the reason assigned being the unsafe condition of the mains in consequence of mining operations.

In 1872 the Company obtained a Provisional Order from the Board of Trade which authorized them to construct new gas-works within one year. That period expired and the works were not begun. The object of this Act, then, is to extend the time for the construction of the works, which it is now enacted shall be substantially commenced within two years, and completed within three years from the passing of this Act. A subsequent section, however, abridges the time for the completion of some works. It is enacted that, if the company do not within one year and six months furnish a good and sufficient supply of gas to the villages of Tonypandy and Porth, it shall not be lawful for them to pay any dividend on their ordinary shares until they do furnish such supply.

A TREATISE ON THE SCIENCE AND PRACTICE OF THE MANUFACTURE AND DISTRIBUTION OF COAL GAS.

XXXVIII.

PURIFIERS.

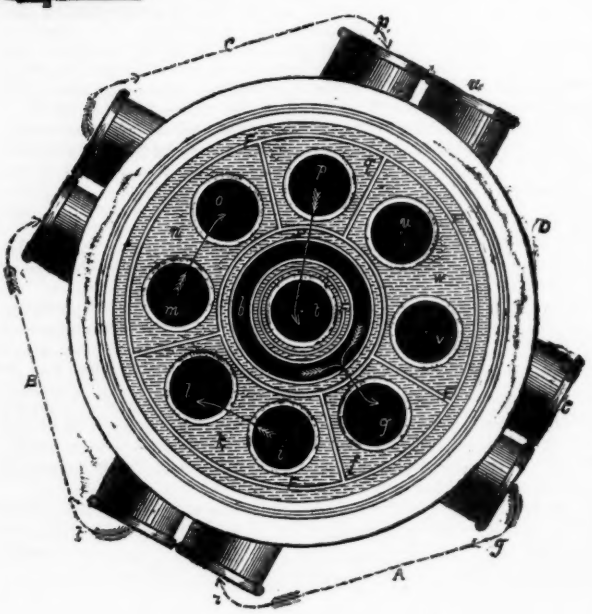


To the genius of John Malam we are indebted for the perfection of Phillips's apparatus, and the production of the beautiful and simple arrangement of purifiers which has now become almost universally employed, alike for the oxide of iron, lime, sulphate of iron, and other solid compounds used as purifying agents.

His arrangement as generally applied, consists of four purifiers in connexion with each other, and with a central valve by which they are controlled, and in such a manner that three of them being in operation, the fourth is shut off, thus affording every facility for discharging the foul material, and recharging the apparatus for purifying. The combination is of the most simple and perfect kind, and, since its invention, the only material alteration made therein has been the substitution of the rotary slide, or dry valve, instead of the hydraulic valve.

The accompanying engravings are copied from Malam's specification. The first represents an elevation of two (of the set of four) purifiers, C and A, the latter being shown in section, together with the central valve, E, which is provided with two supports, *z z*, and raising screw, *x*, with handle, *y*, for the purpose of changing the position of the cover of the valve. The passage of the gas is shown by the arrows entering at *a* into pipe, *b*, and hence successively through three of the purifiers, and off by the pipe, *t*, to the gasholder.

The other figure represents a sectional plan of the central valve on a larger scale. The outer case is of cast iron, and within it are fixed nine vertical pipes, *g*, *i*, *l*, *m*, *o*, *p*, *w*, *v*, and *t*, and another pipe, *b*, concentric to the centre one. These pipes are of such a length as to reach about one-third of the height of the cast-iron tank, and within this is a vessel, F F, similar in form to a small gasholder, affixed to the central rod, and of about half the depth of tank. The interior of



this holder, within about 3 inches from its lower edge, is divided into separate perpendicular compartments, represented by the letters *f*, *k*, *n*, *q*, and *w*, but a communication exists between the space *q* and the inner pipe, *t*, as also with the concentric pipe and the space, *f*. The vessel is charged with water to the height of the perpendicular pipes, the holder or cover of the valve being down.

As represented, the gas enters by the concentric pipe, *b*, and so into the compartment, *f*, which contains the pipe, *g*, through which the gas enters into the purifier A, and, after traversing the purifying material contained therein, issues by the pipe *i*, and this being enclosed in the same compartment with *l*, the gas passes through the latter into purifier B, and issues by the pipe, *m*, and hence by the pipe, *o*, into the purifier, C, whence it passes by the pipe, *p*, to the central pipe, *t*, to the gasholder, as indicated by the various arrows. The pipes *u* and *v*, being the inlet and outlet of the purifier, D, are enclosed in a distinct compartment, so that the gas is shut off from that vessel, ready for discharging. When it becomes necessary to change the purifiers, the vessel F forming the cover of the valve has to be raised by the screw, *x*, to that height that the lower ends of the compartments clear the pipes, when, by the handle, *y*, it is moved in the direction of the arrows one-fourth of the circle, when it is again lowered to its position. This accomplished, purifier A will be out of action, and D, having received its charge of fresh material, is the last purifier through which the gas passes. Thus, whichever pipes the compartment *w* covers are thrown out of action, and this is arranged simply by raising the vessel, turning it to the desired point, and again lowering it.

The patentee, in his specification, says: "My improvements in apparatus for purifying coal gas consist, in the first place, of a peculiar arrangement of the several vessels employed for that purpose, and the adoption of a shifting valve, which applies to a combination of any number of purifiers from three upwards. The object of this arrangement of the purifiers is that the gas may be permitted to pass in succession through a series of three vessels containing the purifying material in different states of saturation, the gas passing through the vessel containing the purest material last, the fourth vessel being at that time out of action, and in a condition to be recharged with a fresh supply of purifying material; and when it may be found necessary to introduce the gas to a fresh supply of the purifying material, the operation will simply be to raise the valve, and turn it one-quarter round, and afterwards to lower it again, by which means the passage of the gas will be shut off from that purifier which contains the material that has been longest under operation; and that vessel, fresh charged, will now be brought into use, the gas passing through it last."

It might be supposed that an apparatus so perfect in principle as that described, which experience has clearly proved, would have been readily adopted by gas companies; but this was not the case, partly arising from the circumstance that for several years after the invention, wet lime purification was alone adopted. The assertion has been made that Phillips was deprived of his patent rights through the combination of the gas companies to resist his just claims, which resulted in the most disastrous effects to the patentee. This statement is erroneous, for at the period in question gas companies were too antagonistic to combine with each other; and, as proved by the evidence of George Lowe, in 1825, on the Oil Gas Bill, only wet lime, or the cream of lime, was employed for purification. Lastly, the dry lime process was really forced on the companies, at least those of the metropolis, about 1841, occasioned by the difficulty experienced in transporting the foul lime, or "blue billy," on account of the odour arising therefrom.

At the period of the first introduction of dry lime purifiers, and for some years afterwards, a most complicated system of slide-valves was employed to control them, there being no less than twelve of these required to work four purifiers. This system, with the water-lutes on the tops of the covers, with moveable pipes, as shown in Phillips's drawings, was retained at many works for several years after the expiration of Malam's patent, clearly demonstrating the apathy of the engineers of that epoch. However, in the course of time, Malam's combination was introduced, when the invention was assigned to the engineer of a large town in the Midland counties. Thus neither Phillips nor Malam derived any advantage from their inventions connected with purifiers—a lot which falls too often to inventors, who achieve much for the public welfare, without advancing their own interests, or deriving any profit from their abilities. Amongst these may be named Ami Argand, the inventor of the burner bearing his name, who was unjustly deprived of the fruits of his intelligence and ingenuity, and, beyond the fact of being recognized as the inventor, never realized any benefit therefrom.

It should have been mentioned, in chronological order, that Daniel Wilson, of Dublin, who, we believe, was subsequently of the firm of Manby and Wilson, which established the "Compagnie Anglaise," for lighting Paris with gas, patented, in 1817, the process of purifying gas from sulphuretted hydrogen, by causing a stream of ammoniacal gas, generated from ammoniacal liquor, to mix with the coal gas in its passage to the gasometer. He says, "The mixed gases may be caused to pass through a perforated plate, placed under the surface of the water contained in any suitable vessel." Since Wilson's patent, similar means of purifying coal gas have from time to time, and frequently, engaged the attention of some of our most able engineers, but to the present day much success does not seem to have attended their exertions.

It may be here observed that notwithstanding the clearness of description in Phillips's specification, there are few processes in gas manufacture which have been so imperfectly applied as dry lime purification. The term is certainly a misnomer, and no doubt has frequently led to the improper application of this method of purifying, for the writer has often witnessed it employed literally as *dry* lime, and sometimes carefully sifted prior to being placed in the purifiers. Lime, when thus employed, is almost useless, and after being in contact with the gas the usual time is simply slightly discoloured, but when well moistened, and in such a state that when pressed in the hand it possesses almost a doughy consistency, it is used to the best advantage.

As the theory and practice of the purification of gas will form a prominent portion of this treatise, we confine ourselves for the present simply to the description of the apparatus as generally used.

(To be continued.)

Correspondence.

WEIGHT OF AMMONIACAL LIQUOR.

SIR,—The annexed table may be useful to those managers of gas-works who sell their ammoniacal liquor by weight instead of by measure.

Table showing the Specific Gravity, Weight per Cubic Foot, and Weight per Gallon of Ammoniacal Liquor of different Strengths.

Degrees Twaddel.	Sp. Gr. and Weight per Cubic Foot in Ounces Avoirdupois.	Weight per Gallon. lbs.	Degrees Twaddel.	Sp. Gr. and Weight per Cubic Foot in Ounces Avoirdupois.	Weight per Gallon. lbs.
Pure Water.					
0	1000	10·0	12½	1062·5	10·625
½	1002·5	10·025	13	1065	10·65
1	1005	10·05	13½	1067·5	10·675
1½	1007·5	10·075	14	1070	10·7
2	1010	10·1	14½	1072·5	10·725
2½	1012·5	10·125	15	1075	10·75
3	1015	10·15	15½	1077·5	10·775
3½	1017·5	10·175	16	1080	10·8
4	1020	10·2	16½	1082·5	10·825
4½	1022·5	10·225	17	1085	10·85
5	1025	10·25	17½	1087·5	10·875
5½	1027·5	10·275	18	1090	10·9
6	1030	10·3	18½	1092·5	10·925
6½	1032·5	10·325	19	1095	10·95
7	1035	10·35	19½	1097·5	10·975
7½	1037·5	10·375	20	1100	11·0
8	1040	10·4	20½	1102·5	11·025
8½	1042·5	10·425	21	1105	11·05
9	1045	10·45	21½	1107·5	11·075
9½	1047·5	10·475	22	1110	11·1
10	1050	10·5	22½	1112·5	11·125
10½	1052·5	10·525	23	1115	11·15
11	1055	10·55	23½	1117·5	11·175
11½	1057·5	10·575	24	1120	11·2
12	1060	10·6			

It will be seen by the above that the weight of the ammoniacal liquor in pounds avoirdupois per gallon is obtained by simply placing the decimal point after the first two figures of the number representing the specific gravity. Thus, liquor of 1025 sp. gr. is 10·25 lbs.; and of 1037·5 sp. gr., 10·375 lbs. weight per gallon.

Each 5° Twaddel represent a quarter of a pound additional weight per gallon; 20° equal one pound.

Gas-Works, Pernambuco, Sept. 30, 1874. THOS. NEWBIGGING.

COMPULSORY PURCHASE OF GAS AND WATER UNDERTAKINGS.

SIR,—In the last session of Parliament the corporation of the town of Neath promoted a bill for the compulsory purchase under arbitration of the gas and water undertakings.

The gas company, while the case was before the committee, agreed upon terms which were embodied in the bill, but the water company, being unable to do so, opposed, and ultimately all powers affecting that company were struck out of the bill.

Mr. Denison (now Sir Edmund Beckett), who acted for the water company, in addressing the committee on their behalf, went very fully into the matter of these compulsory purchases—pointed out how they had been dealt with on all former occasions, and urged the committee to follow the same course, and reject the application, so far as it affected the water company, upon principle, without going into evidence; and this the committee, after hearing him, decided to do.

His address contains much that is important both to companies and local authorities at the present time, and, as it was not printed in your JOURNAL with the evidence, I think you would be doing them a service if you could find space for it in your next publication.

WM. LIVESEY.

Gas and Water Companies Association, 6, Victoria Street, Westminster Abbey, S.W., Nov. 4, 1874.

[Our esteemed correspondent has kindly furnished us with a transcript of Mr. Denison's speech, which we have much pleasure in publishing in another column.—ED. J. G. L.]

RETORT-GRATINGS.

SIR,—On my return from Italy lately I read up the back numbers of your JOURNAL which had accumulated during my absence, and in Art. 30 of the "Treatise on the Science and Practice of the Manufacture and Distribution of Coal Gas," page 364, I found the following:—"The plan patented by Burch upwards of 30 years ago may be adopted. This consists in 'placing an inner door-plate or partition within the *retort*, just beyond the upright or ascending pipe,' leaving space around it for the free passage of the gas."

I at once sent for a copy of this patent, and to my surprise I found that not only was a guard specified, but also a *very close grating*, and that he claimed "an inner door or partition, whether perfect or perforated," thereby clearly anticipating Vincent's patent gratings, on which I read a paper before the British Association of Gas Managers, reported at page 54 of the JOURNAL.

As regards the rest of Mr. Vincent's patent, it does not appear to be in any way similar to that of Mr. Burch. HODGSON JONES.

25, *Old Broad Street, E.C., London, Nov.* 2, 1874.

A CORRECTION.

Sir,—Allow me to state that the figures mentioned in your Journal of Nov. 3, and represented as quoted by me at the banquet given by the chairman of the Halifax Corporation Gas Committee, upon the occasion of the opening of the new railway siding into these works, are inaccurate so far as concerns the price paid for cannel and coal in the year 1873. The following analysis gives a correct statement of the results for 1873 as compared with 1864:—

	1864. Tons. Cwt.	1873. Tons.
Coals used	14,883 18	27,142

	1864.	1873.
Cost of coal	£6,905 2 6	£19,202 0 0
Cost per 1000 feet in coal	12·37d.	18·24d.
Price per ton at works	£0 9 3¼	£0 14 2
Profit on capital	7 18 4 p. cnt.	8 13 6 p. cnt.
Leakage	17·92	9·74
Gross profit	£9,000 0 0	£17,000 0 0

Geo. Dunbar Malam.

Halifax Corporation Gas-Works, Engineer and Manager's Office, Nov. 6, 1874.

HILL'S NEW PURIFYING SYSTEM.

Sir,—I am glad to see Mr. Hills in the field again with an improved form of his liquid purifying process, and what is better still, I hear that Mr. George Livesey is putting it to a practical test. As it is a matter of so much importance, Mr. Livesey, perhaps, will kindly give us a notion of what he has done, and what he thinks of the plan in its present shape.

London, Nov. 7, 1874. G. H.

THE INVENTOR OF THE DRY GAS-METER.

Sir,—In the abstracts of specifications in your last issue, reference is made to the "Glover meter," but as, following most precedents, machines or instruments, bear the name of the inventor and not the manufacturer, I beg leave, through your columns, to present my claim to the so-called "Glover meter."

In the year 1843 I was in the service of the Chartered Gas Company, as mechanical inspector at their Brick Lane station, when I had the misfortune to direct my attention to the construction of dry meters, which, at the period, were very imperfect instruments; and, in ignorance of all that had been previously done, I constructed a meter, with two diaphragms or loose bags, and to control their capacity I employed concave dishes. The meter thus made I submitted to the superintendent of the works, Mr. Croll, and a patent was obtained for it in our joint names.

Afterwards, on experimenting with this meter, I found it to possess several weak points, notably that the bags adhered to the concave dishes, and, with the resolution to remedy the evil, I studied the question, and in a short time produced another meter, "the so-called Glover meter," identical in all its points to that now universally employed. This I also submitted to Mr. Croll, and it was patented in our joint names in March, 1844.

The following June I left the Chartered Company for the purpose of manufacturing these meters. I will not state the capital invested in the enterprise, as it was so small as not to be credited at the present day, nor will I say anything of the difficulties I had to contend with, when all the means of construction had to be invented, the dimensions of all the various parts to be calculated and defined, and this in a business that was entirely new to me. But with all these disadvantages, in less than one year I made upwards of 1000 of these meters, ranging from the 3-light up to 400 lights, and the sizes I then adopted, together with the means of construction, have been retained ever since. Up to that period I believe Mr. Glover never saw the meter, and certainly he was never on the premises where it was manufactured. The only material change made from that time has been in the external case, which any one can ascertain by referring to the specification.

From certain causes, which it is not necessary to state, *I never received the advantage of one shilling, either for the invention or for the time I devoted to it.* I ask, therefore, where is the justice of calling this the "Glover meter?" The invention is mine, and mine only; and if there is any merit therein, I am entitled to it, as the only poor recompense I can ever derive therefrom.

17, *Burton Road, Brixton.* Wm. Richards.

A QUERY.

Sir,—I think there are few of us who will not, upon reflection, share in the doubts expressed by your correspondent, "Alpha," as to the correctness of the late Mr. Bannister's rule for obtaining 10 per cent. acid, it being obvious that the mixture described by him must weigh more than 10 lbs. per gallon, and that, consequently, 1 lb. only of acid being present, it cannot contain 10 per cent., nor have a specific gravity of 1·068.

Apart from this apparent confusion as to what is or is not 10 per cent. acid, the method appears to me to be open to the objection of needlessly introducing an additional source of error in the necessity for accurate measurement as well as weight. Seeing that 10 lbs. of acid of 1·068 sp. gr. contain 1 lb. of acid of 1·848 sp. gr., this can be avoided, and accuracy at the same time ensured, by using a separate measure for the acid, bearing the same proportion to 10 lbs. of acid as the liquor measure does to 1 gallon. I have followed this plan for some years, and found it to answer well.

I need scarcely add that the use of 10 per cent. acid and gas liquor in *equal* quantities gives results which are adverse to the seller of the latter.

Birmingham, Nov. 7, 1874. Chas. Hunt.

Giroud's Rheometer.—We are informed that Messrs. Sidney Leoni and Co., of No. 74, Strand, London, have been appointed sole agents for the sale of Giroud's rheometers. We announce the fact, as it will answer numerous inquiries made to us, as to where this new apparatus can be obtained.

Glasgow Water Supply.—Professor Bischof, of the Anderscnian University, Glasgow, reports that the Loch Katrine water supplied to that city, in the month of October, was yellowish, and contained much "suspended matter."

Legal Intelligence.

COURT OF CHANCERY.—Friday, Nov. 6.
(*Before Vice-Chancellor* Malins.)

THE EUPION FUEL AND GAS COMPANY, LIMITED.

This is a petition for winding up the company.

Mr. Glasse, Q.C., appeared for the petitioner, and stated that the offices were closed, and various other matters were stated in the petition which he did not wish to go into. There was no one present, he believed, who had any right to oppose it. As he understood, the company did not appear.

Mr. Alexander and Mr. Romer also appeared for various creditors in support of the petition.

The Solicitor for Mr. Gurney Fry said he wished to mention to the court that only Mr. Aspinall had been served with the petition, and he understood counsel would have been instructed on his behalf to oppose the petition, otherwise he should have instructed counsel himself. As solicitor for Mr. Gurney Fry, he thought it only his duty to ask that the petition should stand over until the result of the inquiry before the Lord Mayor was known.

Mr. Glasse said he held in his hand a transfer of all Mr. Fry's shares.

The Solicitor said Mr. Fry was a mere trustee.

After some further conversation,

The Vice-Chancellor said he did not think there was much pressure for making the order, and that it had better stand till next week.

ROLLS COURT.—Saturday, Nov. 7.
(*Before the* Master of the Rolls.)

THE FOREIGN AND COLONIAL GAS COMPANY, LIMITED.

A winding-up petition was in the paper this morning. When it was called on by the Registrar,

Mr. Lewis said the petitioner had been satisfied, and the company asked that the petition should be dismissed without costs.

His Honour made the order as prayed.

COURT OF QUEEN'S BENCH, WESTMINSTER.—Wednesday, Nov. 4.
(*Sittings in Banco, before the* Lord Chief Justice, *and Justices* Blackburn, Quain, *and* Archibald.)

BEGBIE *v.* THE PHOSPHATE SEWAGE COMPANY.

Sir Henry James (with him Mr. Cohen, Q.C., and Mr. Lanyon) moved, on the part of the company, to set aside the verdict obtained in this case, which was an action to recover back the sum of £15,000 paid to the company for the "sole and exclusive right" of using a process of theirs for the conversion of sewage into manure. The plaintiff had represented a company to be formed at Berlin for the purpose, and the contract was negotiated through one Hartmont on the part of the defendant company, and the words "sole and exclusive" were inserted by him. In point of fact, there was no patent and no "exclusive right" on which the plaintiff claimed to recover the money. The case was tried at the Guildhall, before the Lord Chief Justice, when the defence was that the words "sole and exclusive" had been inserted improperly, without the authority of the defendant company, and in the interest of the plaintiff, and with the view of getting up the shares of the Berlin Company in the market. The verdict was entered for the plaintiff, subject to leave to move the court upon the question.

The Court granted a rule *nisi*.

HANTS MICHAELMAS QUARTER SESSIONS.

Winchester, Tuesday, Oct. 20.
(*Before Viscount* Eversley *and a Bench of Magistrates.*)

THE MAYOR AND CORPORATION OF RYDE, APPELLANTS, *v.* THE GUARDIANS OF THE ISLE OF WIGHT UNION AND THE CHURCHWARDENS AND OVERSEERS OF RYDE, RESPONDENTS.

Mr. Lopes, Q.C., and Mr. Loveland appeared for the appellants; Mr. Bullen and Mr. Jephson for the respondents.

Mr. Lopes said in this case there were originally two grounds of appeal, but one of them had been withdrawn, and the appeal in the present instance was against a rate made on the 4th of July, 1874, upon the property of the mayor and Corporation of Ryde, in a sum of £900 gross estimated rental, and £675 rateable value, in respect of their water-mains and service-reservoir in the municipal borough of Ryde, and in a sum of £200 gross estimated rental, and £150 rateable value, in respect of their water-works and mains in a place called Ashey, being a portion of the parish of Ryde. The only question which the court would have to consider would be the *quantum* of the rate, the appeal being taken upon the ground that it was excessive.

Mr. *T. Hawksley*, C.E., and past president of the Institution of Civil Engineers, stated that he had had very large experience in the construction and valuation of water-works, extending over many years. He had inspected the Ryde Water-Works, in company with Mr. Stayton, the borough engineer. He had received the fullest particulars from him of all details in the original cost and working expenses, which he believed to be very reasonable and reliable. The proper method of assessment was to assume what the works would be let at to a hypothetical tenant. Looking at the matter from this point of view, he estimated the net rateable value of the property in Ryde at £167. The total cost of the works being £27,000, he estimated that £15,000 of that amount had been expended in Ryde. The present water-rate was at 8d. in the pound; he therefore assumed that the tenant would collect that amount, which, with the out-districts, trade purposes, shipping, and building, realized (after deducting voids, &c.) £2808. The disbursements in salaries, management, working expenses, and rates and taxes deducted from it, left £1065 as the net rental; and after allowing for interest on tenant's capital, risk, trade profits, and renewals, it left £300 as the net rateable amount for all the works in the three parishes, which are rated at £1095 under the new assessment. If, however, it was held that the full schedule prices of 9d. in the pound were to be charged, it would increase the value by £263. The proper allocation to Ryde parish would be 15-27ths of the whole; because, taking the value of the works at £27,000, there were £15,000 value in Ryde parish. Such was, in his opinion, the only fair mode of apportionment.

Mr. *George Henry Stayton*, C.E., and for nearly two years past borough surveyor of Ryde, substantially corroborated the testimony of the previous witness, his estimate of the total revenue of the water-works being somewhat less; although, in consequence of not including certain matters which Mr. Hawksley had, he admitted giving a higher total estimate to the Ryde Assessment Committee.

Mr. Bullen, for the respondents, said he and his friend Mr. Lopes were not at any great contention upon the material facts of the case. The matter really resolved itself partly into a question of fact, and partly into one of principle—viz., was the assessment to be based upon the actual profit made by the present water-works company, or upon the profit which might be made by a hypothetical tenant? He contended that, taking the water-works as existing, and the hypothetical tenant as also willing to take them, the latter must be assumed, for the purposes of the Assessment Act, as willing to take the premises upon the highest profit he could make with them. The Ryde Corporation were peculiarly situated, and their case was different from an ordinary tenant, inasmuch as they had a double interest in view—viz., not only their own interest *qud* the water-works, but also—or, rather, they should have—the interests of their fellow-citizens who were supplied with the water and had to pay for it;

and it was not for them, considering whence the profits were to arise, to work the profits out to the uttermost. It was not, however, for those who assessed these premises to consider any such vagary as this entertained by the corporation, but to say, "These works are capable of making such and such a profit, and therefore we are justified in assessing you upon it." Mr. Hawksley's assessment was based upon a charge for the water of 8d. in the pound, but a hypothetical tenant, realizing the utmost he could out of the water-works, would collect 9d. in the pound for the water, power for levying which was given under the schedule.

Mr. *Henry D. Martin*, C.E., of Abingdon Street, Westminster, was called. He said he made the gross receipts to be £2970, estimating the working expenses to be £1206 (Mr. Hawksley's estimate being £1225), and the expenses of management £232 10s. He gave general evidence in support of the rate made, in the course of his examination mentioning that he, as the proprietor of a railway, never insured his boilers.

Mr. LOPES: What railway is that?

Witness: The Cowes and Newport.

Mr. LOPES: And have you ever had a dividend from that?

Witness: No.

Mr. LOPES: Then no wonder you take such a desponding view of profits.

In reply to a further question from Mr. LOPES, *witness* said for 15 years he had been proprietor of this railway, and had never had a dividend yet.

Mr. LOPES: And yet you do not despair?

Witness: No.

In further cross-examination by Mr. LOPES, *witness* admitted that throughout, for working expenses, &c., he had adopted the figures of the witnesses for the appellants. He had made a calculation apart from this himself.

Mr. LOPES asked for this document, but Mr. Bullen refused to put it in, and said Mr. Lopes might just as well ask him for his brief.

Mr. LOPES said he should be quite satisfied with asking for the document.

In reply to the Chairman, Mr. LOPES said, provided the water-rate was to be put at 9d., he agreed with Mr. Bullen's witness that the gross revenue was £2970.

Mr. *Francis Newman*, civil engineer, of Ryde, and formerly for 18 years the borough surveyor, also called for the respondents, said he agreed with many of Mr. Hawksley's figures, but he estimated the working expenses at £1062, and of management £222 10s.

Mr. BULLEN then summed up the case for the respondents, after which Mr. Lopes replied for the appellants, saying that they were ready to admit that a hypothetical tenant would hold his rent-charge at 9d. in the pound, and therefore they agreed upon the figure of £2970 as the total revenue. He then dwelt upon the fairness of the sums his witnesses alleged should be properly deducted from this amount before the basis upon which the rate was made was arrived at.

At the conclusion of the address, the CHAIRMAN said the court reserved its decision, and would give it before the sessions terminated.

THURSDAY, OCT. 22.

The COURT gave a decision in this case to-day, by which the assessment of the works was reduced to a gross rateable value of £625, and net £250. The respondents to pay costs.

MANSION HOUSE POLICE COURT.—MONDAY, NOV. 2.

(*Before the* LORD MAYOR.)

EUPION GAS COMPANY'S SHARES.

The further hearing of conspiracy to defraud the London Stock Exchange, preferred against Messrs. *Joseph Aspinall, Samuel Gurney Fry, George Parkyns Knocker, John Saunders Muir, Charles Knocker*, and *William Whyte*, in connexion with the Eupion Gas and Fuel Company, Limited, was resumed this day.

Mr. POLAND and Mr. BESLEY were counsel for the prosecution; the defendant Aspinall was represented by Mr. MONTAGU WILLIAMS; Fry by Mr. STRAIGHT and Mr. W. S. MASTERMAN; G. P. Knocker by Mr. ROLLAND; C. Knocker by Mr. ST. JOHN WONTNER, solicitor; and Whyte by Mr. H. R. HODSON. Muir defended himself.

The defendants having duly surrendered to their recognizances, additional evidence was given as to applications for shares by persons who paid no money but signed blank transfers.

Mr. *Henchman*, the late general manager of the Midland Banking Company, was also examined as to the transactions of Muir, to whom he stated that unless banks had blank transfers giving them power to sell they would probably not advance money on shares.

TUESDAY, NOV. 3.

The case was resumed to-day.

Mr. *Parker*, secretary to the Stock Exchange Committee, deposed to the representations on which an official quotation had been granted for the company's shares.

Mr. *Reed*, of Sir Robert W. Carden and Co., described his transactions with the defendant Charles Knocker.

Mr. *Richardson*, financial agent, was examined as to a sham purchase of 1000 shares, which he made at the instance of the same defendant.

The case was adjourned till Friday.

FRIDAY, NOV. 6.

The first witness called to-day was

Mr. *John Annan*, gas engineer, of Wolverhampton, who deposed that he was requested to apply for shares in the company by the defendant Whyte, and on the 28th of March last he signed a letter of application for 150 shares. He paid no money on the application nor on the allotment, and he afterwards transferred the letter of allotment to Whyte. He signed the transfer in blank, and he believed he sent it back by post, never having paid any money at all on the transaction.

In cross-examination, *witness* said he had given his services to the company as an engineer, and understood that he was to receive the shares in question by way of remuneration for those services. He remembered going to Great Marlow and seeing an experiment tried in lighting that town by the process which the company were engaged in promoting. The invention appeared to him to be an economical and admirable method of lighting; and, from the practical test at Marlow and other tests, he was confirmed in his opinion of its merits.

In reply to the defendant Muir, *witness* said he was a practical engineer, and that the invention was subjected to other experiments which had proved perfectly satisfactory. He had no hesitation in saying the process of lighting was admirable for small towns, villages, hamlets, churches, and private mansions, but not in respect to large towns. He understood it to be Kromschröder's patent he was called upon to test. For the trouble he took, his personal expenses, and loss of time, he received no other consideration than the shares he had mentioned, and, until these proceedings were taken, he had thought he was well paid.

In re-examination, *witness* said he had written a report upon the invention, which was printed in the prospectus. He believed he was still the registered proprietor of the shares. He did not know, when he made the experiments, whose patent it was, but he understood it was Kromschröder's.

Mr. *William Robert Cooper*, gas engineer, Banbury, said he was asked to apply for shares in the company, about March last, by the defendant Whyte, and afterwards signed an application for 150 shares. He paid no money either on the application or allotment, and did not remember receiving any allotment letter. He afterwards signed a transfer of the shares, in which the name of Whyte appeared in pencil as that of the transferee. He made a report to the company on the 3rd of February last, at the suggestion of Whyte, which was afterwards printed and circulated. He received no remuneration, and did not know that the shares were entered in the name of the defendant Aspinall, nor could he swear that Whyte's name was written in pencil in the transfer as transferee, but he thought it was.

Replying to the LORD MAYOR, *witness* said he merely signed the papers because the defendant Whyte sent them to him. He had known Whyte over twelve years; he supplied coal to the Banbury works, and witness had every confidence in him. He knew him, moreover, to be a highly respectable man.

In answer to the defendant MUIR, *witness* said he was manager of the Banbury Gas-Works, and had had great experience in gas matters. He was called in professionally to test an operation for supplying the whole town of Marlow with gas. As a light-giving means his opinion was that the system was superior to anything of the kind he had ever seen before. He subjected it to further experiment and trial, the result being to confirm him in his first impression. It was so good, indeed, that he recommended it for adoption to the agent of the Duke of Marlborough as a mode of lighting Blenheim Palace. He was still of the opinion that it was the best thing of the kind he had ever seen. He had not been remunerated for his trouble or loss of time in the matter, except by the shares to which he had referred, and he considered he was well paid by those shares. He expected the shares were to be sold for him by the defendant Whyte. He could not say whose patent it was; he only knew it as Eupion gas.

The LORD MAYOR said it was a strange mode of proceeding for a person to assign away his remuneration directly on its receipt; but he supposed the witness was a man of expectations.

Mr. *Edward Baker*, gas engineer, Reading, said he authorized no one to sign for him the letter of application produced for 335 shares in the company, nor did he receive any letter of allotment; but he admitted that the defendant Whyte had acted for him. Witness neither paid nor received anything in relation to the transaction. He signed the transfer produced for 335 shares on March 27 last to Mr. Whyte, whose name he inserted in it at the time. Witness understood the allotment to himself was to be for professional services. It was first agreed between him and Whyte that witness was to have 750 shares for his professional services in connexion with the company. That was long before March last. Witness had reported on the company, and his report was printed and circulated with the prospectus. He had known Whyte eight or nine years as being connected with the Ruabon Coal Company. Witness had spent considerable time in investigating the patent, and the shares were to be in remuneration for his services.

In cross-examination by the defendant MUIR, *witness* said he was a gas engineer of 22 years standing, and now practised at Reading. He saw the apparatus used in the Marlow experiment and in Cannon Street, and he believed it was Kromschröder's patent, not Voigt's. For the purpose of lighting isolated places, churches, and railway stations he thought it would be very useful, but he strongly demurred to its being used in lighting large towns. He was so convinced that it must be a success that he took his remuneration in shares of the company.

Mr. *Ernest Dawson*, head clerk to Messrs. Richardson and Son, of 8, Great Winchester Street Buildings, financial agents, deposed to the operations which had taken place in Eupion shares for the account, and the result of his dealings.

The case was adjourned until Thursday next.

Miscellaneous News.

METROPOLITAN BOARD OF WORKS.

A Meeting of the Board was held on Friday last, the 6th inst.—Colonel Sir JAMES HOGG, M.P., in the chair.

The CLERK read the report of the Works and General Purposes Committee, which, so far as relates to the gas question, was as follows:—

Your committee have proceeded upon the resolution of the board of Oct. 2, 1874, referring it to them to consider with the solicitor the form of instruction to be given for the preparation of the draft bill on the subject of gas supply mentioned in the resolution of the board of July 31, 1874 (No. 8), and also to confer, if necessary, with the City authorities thereon.

The resolution of the board of the 31st of July was, it will be remembered, an instruction to the solicitor to prepare a bill, to be introduced in the next session of Parliament, to enable the board to provided an independent supply; but, after careful consideration of the matter, and conference with the board's solicitor and parliamentary agent, and with Mr. Stevenson the gas engineer, your committee are of opinion that the best course will be to submit to Parliament three alternative proposals.

1. The establishment of new gas-works to enable the board to supply gas in competition with the companies.
2. The acquisition by the board of the property of the companies.
3. The application to all the companies of an improved and uniform system of regulations.

There will thus be placed before Parliament every possible way of dealing with the subject, and whichever alternative the Legislature may, after full inquiry, see fit to adopt, it is hoped that the result will be to place the gas supply of the metropolis on a more satisfactory footing than it is at present.

Your committee think it important that the board should be able to show the Legislature that it could establish a complete system of gas-works, with all the machinery of distribution, with an expenditure very considerably less than the aggregate nominal capital of the companies, which at the present time is upwards of £10,000,000; and from a report on the subject by Mr. Stevenson, which they have had before them, they feel themselves in a position to prove this point satisfactorily.

A deputation from your committee has conferred with the City authorities on the matter, and further meetings are to take place. Your committee are not yet able to report on this part of the reference, but they think that they are justified in saying that the endeavours of the board to improve the existing supply of gas, will have the cordial co-operation of the corporation.

Your committee have now only to recommend that the solicitor be instructed to issue the necessary notices in accordance with the report; that it be referred to the Parliamentary Committee to prepare the necessary bill or bills; and that the whole question be referred back generally to the Works, &c., Committee, to confer further with the corporation of the City of London, and to report the result to the board.

Mr. LESLIE: I should like to ask a question before you give those instructions. What is the date of the order of this board instructing the committee to take steps for the acquisition of the property of the gas companies? I know that there is a report of the committee not long since, containing a recommendation entirely against such a step being taken. If the board have given no instructions to the committee, it is not competent for them to take into consideration the question of purchasing the gas-works.

The CHAIRMAN: There is no order whatever to that effect. There is an order that a bill be prepared for a competitive supply, and that was referred to the Works Committee, and they have now brought up a report upon it. It is perfectly competent to the committee at the same time to recommend the board to do something entirely contrary.

Mr. LESLIE: When did the board instruct the committee to prepare a bill for the application to all the gas companies of "an improved and uniform system of regulations?"

The CHAIRMAN: I can only give the same answer—the board have given no such instructions; but if such a recommendation come up from the committee, it is competent for them to adopt it or not.

Mr. LESLIE: I want to know next what power there is in a committee to whom a reference is made by the board to delegate that power to a sub-com-

mittee. I should like to see the clause in the Act of Parliament which would justify the committee in taking such a course.

The CHAIRMAN: I am happy to answer any questions that may be proposed to me, but I do not think the question of the honourable member is relevant to the point now before the board—viz., the gas supply. At the same time, I may observe that here, as in the House of Commons, if a question is relegated to a committee, it is competent for that committee to refer that question to any numbers of their own body, from whom they may receive advice to bring up and lay before the board. There is nothing in the Act of Parliament about it—it is a matter of common sense and practice, whether at this board or elsewhere.

Mr. LEGG: Do I understand that, if we pass this recommendation to-day, it will be the first resolution of the board in reference to the purchase of the gas companies? (Question.)

Mr. RICHARDSON: The Works Committee may, I think, consider this a red-letter day, for, the board having already agreed to their proposal respecting the freeing of the toll-bridges at an expense of upwards of a million, they now submit a proposition which will involve the expenditure of many millions. I hope, however, that honourable members will not be startled when I speak of these large sums, for there is this difference between the last proposition and the present, that in the one case there will be no return, except indirectly, for the outlay, whereas the other is simply a purchase of property which is worth the price we shall give for it—indeed, we anticipate that it will be worth a great deal more. In dealing with this question, I shall endeavour to show that under existing gas legislation all control is virtually lost to this board, who have been appointed by the Legislature the custodians of the interests of the gas consumers. In fact, all gas legislation up to the present time has been one large failure. There are nine gas companies in the metropolis under the provisions of the Acts of 1860 and 1868, and it is only with these that I propose to deal. The united share capitals of these companies is £8,759,516. In addition to this they have a loan capital of £1,404,357, making together £10,163,873. Of the share capital, no less than £6,787,000 is entitled to a maximum dividend of 10 per cent., and the remaining portion to dividends of 7 and 7½ per cent. But when we speak of this large capital it must not be supposed that the property of the companies at all represents it. We know that a large portion has been lost to the companies in years gone by, through the competition which existed between them, and one of the strongest proofs of the failure of past gas legislation is that, notwithstanding this portion of the capital is no longer represented by property, it has been, as it were, kept alive by the permission given to the companies by Parliament to continue to pay dividends upon it. And the fact of allowing 10 per cent. upon it has been to add a 50 per cent. premium to the value of the shares of the companies. In addition to the capital I have named, the companies have power to raise further sums to the extent of £2,366,000, of which £1,211,000 is entitled to 10 per cent., and the remainder to 7½, 7, and 6 per cent. dividends. If we make a calculation of the saving to the metropolis—if the companies had been required by the Legislature to raise this money, as they could do, on loans and debentures, instead of by the issue of shares—we find it amounts to no less than £70,221 annually. (The speaker proceeded at some length to speak of the effects of the amalgamations which have taken place of late years, and of the proceedings before the Revision Commissioners. He also contended that 10 per cent. was too high a maximum dividend, and that, on the manufacture of so necessary an article as gas, 6 per cent. was ample. The members of the board were, however, rather impatient at the prolixity of the honourable member. There were repeated cries of "Move, move," and Mr. Newton reminded him that it would be necessary to come to a decision before the day was over. He continued:) The subject is a very large one, and I have only made a selection of some facts. The question now is, what shall be the remedy for this state of things? I take it to be generally admitted that existing legislation is imperfect and unsatisfactory. Mr. Cardwell's committee recommended that if the companies would not come to proper terms, Parliament ought to give the board power to compete. We have made every exertion, as the representatives of the gas consumers, to get some amendment; but in every instance that we have gone to Parliament, or before the referees, for the purpose, we have been thrown upon our backs. The committee have considered all these matters. The question referred to them was as to the establishment of an independent supply, but they have thought it desirable that other alternatives should be submitted to the Legislature—viz., the purchase of the companies or a system of regulation. The committee think that Parliament must decide in favour of one or other of these schemes, and that it will be better for the board to bring them all forward, and leave the Legislature to adopt which they think best. I may say, in conclusion, that there have been conferences between the corporation and the committee, and that we have been met most kindly by them. They have assented to go with us hand in hand, and, in consequence of our communications with them, it will be necessary to add a few words to the recommendation of the committee, which will read thus:—"That the solicitor be instructed to issue the necessary notices in accordance with the report; that it be referred to the parliamentary committee to prepare the necessary bill or bills in accordance with the joint views of the corporation and this board, and that the whole question be referred back generally to the Works, &c., Committee, to confer further with the corporation of the City of London, and to report the result to the board."

Mr. FOWLER: I second the motion. The committee have taken up more ground than the board authorized them to do, but this has been done under the advice of the parliamentary agent. If the consumers are to get any advantage from our interference in this matter, it can only be through our taking up the whole of the ground. I have no doubt that, with the assistance and co-operation accorded to us by the corporation of the City of London, it will not be possible for the gas companies to override the justice of the case, and that we shall gain our object. But if we had gone to Parliament upon the original terms of the reference to the committee, I do not believe we should have been successful. The great object we have in view is to get a better system and a lower price of gas. Our wish is not, except it is forced upon us, either to buy the companies or to erect works to manufacture gas ourselves. I trust, therefore, the board, being satisfied that the object of the committee is to get a better arrangement made, will accept the recommendations in the report.

Mr. LESLIE (who spoke amidst constant interruption throughout) said: I rise to oppose this motion, and I am going to do it in a very open manner, and not behind the back of any one. I tell you, therefore, at the outset, that you have no legal authority for anything that Mr. Richardson has been proposing to-day. I have here all the documents, or copies of them, and am prepared to prove all I say. Mr. Richardson has referred to Mr. Stevenson, and I do not wish to make any remark disrespectful to that gentleman. He is a parliamentary gas engineer, and he was engaged on your side at the time when Mr. Richardson quotes him; but on the next occasion he was opposed to you. Mr. Richardson has referred to the nine gas companies at present supplying the metropolis, and the amount of their capital, £10,163,873. But he had not mentioned what was the average dividend paid by the companies on that capital. Their net profits for 1873 amounted to £744,784, which was an average of 7·32 per cent. on the capital employed. These were the net earnings, and the details I can give you. The Imperial Company earned a per centage upon their capital of 6·25; The Gaslight and Coke Company, 7·84; the South Metropolitan, which, according to Mr. Fowler and Mr. Dresser Rogers, is the best company in London, earned 7·8; the Commercial, 6·55; the Independent, 7·23; the London, 7·83; the Phœnix, 8·04; the Ratcliff, 9·11; and the Surrey Consumers, 7·97 per cent. These companies, one and all, hold in the metropolis very nearly 500 acres of land; but Mr. Richardson forgot to tell you that there are eight other gas companies supplying parts of the metropolis. The sub-committee were asked, "Will you include them, or shall they be omitted from the calculation?" "Let us omit them," they said; all of which Mr. Richardson appears to be entirely in the dark about, as he generally is. Now the coals used in London last year by the nine companies amounted in quantity to 1,430,934 tons, and in money value to £1,753,716. They received for residuals £945,052, and they paid in the shape of coal duty £77,508, of which the corporation of the City claimed no less than £23,849. Now all these are most important facts to bear in mind, and which will have to come before Parliament. In the step you are about to take, it will be seen whether you, aided by the advice of Mr. Smith, are right, for unfortunately in this gas question, he has been wrong from beginning to end. His opinion has been upset by the four judges of the Court of Queen's Bench, and on appeal to the Court of Exchequer it was upset by every one of the judges there.

Mr. SMITH (solicitor): I hope you will allow me to say that I never gave an opinion at all. The very utmost I did was this. The late Sir John Thwaites came down to me very suddenly upon one occasion, and asked: "What is your opinion of the construction of the Act?" and I answered him without having time to look much into the question.

Mr. LESLIE: But you said that you had most carefully considered the subject. (Interruption.)

The CHAIRMAN: It is rather inconvenient that members should attack the officers of the board in this way. (Hear, hear.)

Mr. LESLIE: I beg pardon, but he is as much an officer of mine as of any other member, and if he has led us wrong before, I think he had better not lead us wrong again. And I say that if we have to go to Parliament with such a rotten case as Mr. Richardson has made out to-day, we shall be laughed at for our pains, and very properly so too. Now let us hear what Mr. Stevenson recommends you to do. I am going to read his report.

Mr. ROCHE: And I am going to rise to a point of order. Mr. Stevenson was consulted on behalf of this board.

Mr. LESLIE: No——

Mr. ROCHE: By this board through its committee and sub-committee. That being so, it has been the universal practice and rule of the board that the confidential advice, both of its own officers and counsel, and of experts like Mr. Stevenson, cannot be referred to in any public discussion, or alluded to at the metings of the board. (Hear, hear.) I therefore ask the chairman whether, in accordance with our practice, Mr. Leslie can read this report.

The CHAIRMAN: The honourable member is perfectly right. The universal practice is that when a confidential communication is made to a committee it cannot be referred to at the board, unless it should be embodied in the report of the committee.

Mr. LESLIE: Why, sir, Mr. Stevenson is now proceeding to work upon the estimate given in by him to the sub-committee, which estimate has been reported by them to the committee, and is now brought before the board to-day. I should be glad to know, therefore, why I am not entitled to read it. (No, no.) Well, I may refer to it.

The CHAIRMAN: Mr. Stevenson's report has not been brought up, and ought to be treated as a confidential communication.

Mr. LESLIE: Sir, I say that Mr. Stevenson has recommended the board to erect gas-works at——

Mr. ROCHE: I rise to state that unless the ruling of the chairman is accepted on this point, I shall move that strangers do withdraw. (Hear, hear.)

Mr. LESLIE: You may move what you like; but surely we are not to be prevented from investigating a subject which is going before Parliament.

The CHAIRMAN: As long as I sit in this chair, and have the confidence of the board, I shall insist upon my ruling being accepted. (Hear, hear.) I request the honourable member to go on with his speech, and leave Mr. Stevenson's report alone.

Mr. LESLIE: I bow to you, sir; but you shall have it in another shape. (Vote, vote.) I suppose I may read the report of the sub-committee. (No, no.) Do you, sir, rule that I am not to read the report of the sub-committee?

The CHAIRMAN: The sub-committee was appointed by the Works Committee. They have had a conference with Mr. Stevenson and various other persons. The documents given to them are private, they are not brought out in the report of the committee, and might be prejudicial to the board and the general interests of the public if they were read. I am quite sure the honourable member does not desire that.

Mr. LESLIE: All I want to do is to bring the question fairly before the board, so as to let them see the plunge they are going to make. Surely the very foundation of all that Mr. Richardson has been stating is, that it will cost us so much money to obtain possession of all the gas-works, and so much money to erect new works. Have I not a right to quote the document, which goes to show that the cost of new works will be about £6,000,000? Because you know, if you succeed, you will have to borrow that money under the Loans Act. Now, what is to be done? Without reading Mr. Stevenson's report, I may say the proposition is that you shall erect gas-works adjoining the outlet at Barking for the north side, and that you shall erect other works for the——

Mr. ROCHE: I rise again to order. The honourable member is now referring to a document which the chairman has ruled to be a confidential communication, and he is endeavouring to state the contents and effect of that document. I ask whether this is right.

The CHAIRMAN: It is very unpleasant for me to be always rising to call the honourable member to order. This is one part of the report.

Mr. LESLIE: And a very important part. I will ask, then, for the report of the committee brought up to-day, and out of that I will extract the information. (The honourable member read the report, commenting upon it paragraph by paragraph as he proceeded.) You see, therefore, that we have here the substance of the information which you say I must not obtain from the report of the sub-committee. This is what you are going to sanction, and this is what I oppose in your interests and the interests of the gas consumers, as well as the ratepayers at large. The committee say: "A deputation from your committee has conferred with the City authorities," and that "they are justified in saying that the action of the board for improving the supply of gas will have the cordial co-operation of the corporation." Why, you had the "cordial co-operation" of the City in 1860, but they refused to pay any portion of the costs then incurred, and you had a lawsuit about it with your parliamentary agent. Now, sir, after I have read this you will take off your interdict. I have brought into court the strongest evidence as to Mr. Stevenson's report, and, with your permission, I will now read it.

The CHAIRMAN: I rule the same thing as I did before.

Mr. LESLIE: You will not allow me to read it?

The CHAIRMAN: Certainly not.

Mr. LESLIE: Of course the public will understand what that means. If I cannot have all I want I must get all I can. I have told you that the gas companies of the metropolis have to pay for City dues on coal £77,508 per annum; they also pay for rents, rates, and taxes, £81,585. These things will have to come out, however much you may try to blink the question here, and not let matters be brought forward when it is the time to save the ratepayers money. The steps you are recommended to take will involve the employment of ten or a dozen parliamentary agents, and a long array of silk gowns and horsehair wigs; and you will have to pay for the whole of this, while you will be retarding the reduction of the price of gas, because the companies will have to charge the whole of their expenses upon the gas consumers. Allusion has been

made to the unsatisfactory state of legislation on this subject. The City of London Gas Act, 1868, is, in my opinion, the origin of the whole mischief, and that Act lies at the door of the corporation. They had a chance a few years ago to buy up a company to supply the City, and they would not embrace it. They are now offered, by the only company that supplies the City, a reduction of £100,000 per annum, accompanied by the removal of the works from Blackfriars. I say this is a proposal they ought to be glad to accept. And what are we going to do? The board are to be thrown into a state of turmoil, and the companies into a state of confusion—for what? Do you suppose that, if Parliament should grant you power to make gas, you could supply it better than the companies, or cheaper than 3s. 9d.? No. I believe this 3s. 9d. will be reduced shortly to 3s., if you do not stop it—if you do not involve the companies in these frightful and enormous parliamentary expenses which they must incur in opposing you. You are going to Parliament with three schemes, and intend to say, "Don't you like No. 1?—take No. 2. Don't you like No. 2?—take No. 3." But parliament may say, "We will give you No. 4," and you may be worse off when you go out than when you go in, as you always have been. You and the corporation went to Parliament in 1868, and what did you get? Why, that with which you have been thoroughly disgusted ever since. Perhaps I ought to apologize for what I have said, but I feel strongly on these points, and I want to warn you against the course you are recommended to adopt, which can end in nothing but the renewed defeat of the board and the corporation, and which will entail upon the ratepayers of the metropolis an enormous amount of expenditure. There is one other matter I might allude to, but it is a very small matter, I suppose, in your eyes—I mean the breaking up of the streets of the metropolis. No less than 1500 miles of roadway must be torn up—for what? To establish a competing supply—that is, if you get No. 1 scheme. If you succeed with No. 2, I do not know how many millions of money you will want to buy up the interests of the gas companies. Mr. Richardson has not told us, which he might have done, for he has proceeded upon that which I am not at liberty to read. Just one other point. It appears that no estimates require to be deposited in going to Parliament to establish gas-works. That is rather a funny proposition, and I do not think you will get off without them. I do not know whether it is possible that some gentlemen here are taken up with the absurdity current just now that the sewage of the metropolis will make very good gas. If so, they may think the main drainage may go to the wall, and this scheme will serve their purpose.

Mr. Legg: When Mr. Richardson began to speak, my mind was made up to go against him. I thought we were going to Parliament for three bills, but hearing from Mr. Fowler that it is not intended to go for power to give an independent supply——

Mr. Fowler: I said nothing of the sort.

Mr. Legg: Well, then, that it was not intended to go in for the purchase of the existing gas-works. (No, no.) I support the motion now, feeling that all that is intended is the regulation of the future supply of gas. I am sure that my vestry, for one, would never vote for the purchase of gas-works by the board, or for giving the board power to erect new gas-works. Why, you would have to go to an expense of 6 or 7 millions, and you would have the competition of the whole of the companies against you. I am afraid, as it is, you are going to Parliament to spend £20,000 or £30,000, as you have in many other cases, for an object which will in no way benefit the gas consumers.

Mr. Brushfield: You know very well that I have a great interest in this gas question. Now, I say that but for the licence given to some of the companies, by the Act of 1868 to increase the price of gas to any extent, we should never have had this question raised to-day. I say that Act was one of the most ridiculous ever passed. If the Act of 1860 had stood as it was, I am satisfied there would have been no cause of complaint, and I am satisfied also that if the companies who have raised their price under the Act of 1868 had been content for a while with a less dividend, as they ought to have been, things would have gone on quietly still. Let gas companies earn their 10 per cent. fairly if they can, and the consumers will have nothing to grumble at; but when they are told they can charge any price they please to make up their dividends, there is no motive to economy. As to the recommendations in the report of the committee, I think perhaps the third, which relates to an application to Parliament for an improved and uniform system of regulation may be all very well, but I am persuaded that either of the other two would be a source of great damage to the public. The gas companies have expended hundreds of thousands of pounds in arriving at their present state, and now that they have reached a paying point I do not think it right that we should step in and deprive them of the advantages they have earned.

The motion was then put and carried, and on a division being called for by Mr. Leslie, more than half the members of the board being absent, there appeared—

For the motion	18
Against it	3
Majority for	15

METROPOLIS GAS SUPPLY.

Dr. Stevenson's report on the gas supplied by the Imperial Company to the vestry of St. Pancras, during the month of October, 1874:—Maximum light estimated by sperm candles, according to the Act—15·1. Minimum light, sperm candles—13·1. Average light, sperm candles—14·0. Traces of ammonia, indicated by turmeric test-paper—traces on all occasions. Traces of sulphuretted hydrogen, indicated by lead test-paper—none at any time. Sulphur, 17·82 grains per 100 cubic feet.

St. George-the-Martyr, Southwark.—The vestry of this parish have passed a resolution, which has been communicated to all the other vestries and district boards, stating that in their opinion it is not desirable, nor to the interest of the ratepayers, that the Metropolitan Board of Works should have power to compete with the gas companies in supplying gas to the public.

METROPOLIS WATER SUPPLY.

Dr. Frankland, F.R.S., reports, as the result of a chemical examination of the waters supplied to the metropolis during October, that, taking the amount of organic impurity in a given quantity of the Kent Company's water (derived from deep wells in the chalk) as unity, the proportional amount of this impurity in an equal volume of river water supplied by each of the other metropolitan companies was—New River, 1·4; East London, 1·8; Southwark, 2·3; Chelsea and West Middlesex, 2·4; Grand Junction, 2·6; and Lambeth, 2·7. It appears, therefore, that the improved quality of the river waters which usually prevails during summer was maintained at the beginning of October. The sample of Chelsea Company's water was slightly turbid when drawn from the main; those delivered by all the other metropolitan companies were, however, clear and transparent. The New River Company's water showed a considerable improvement, as regards its degree of organic contamination, upon that supplied during September. The evidence of previous sewage or animal contamination was comparatively small in all the river waters, and in the East London Company's water it had been nearly destroyed by "long storeage." The Kent Company's water continues "uniformly bright, palatable, and wholesome."

The Registrar-General publishes the following return of the average daily quantity of water supplied by the London water companies, during the month of September, 1874. According to their returns 120,870,965 gallons, or 549,172 cubic mètres of water (equal to about as many *tuns* by measure, *tons* by weight) were supplied daily; or 235·7 gallons (107·1 decalitres), rather more than a *ton* by weight, to each house, and 33·2 gallons (15·1 decalitres) to each person, against 33·1 gallons during September, 1873. According to returns of the London water companies made to the select committee on East London Water Bills (session 1867), it is estimated that, during the year 1866, about 82 per cent. of the total supply of water for all purposes was for domestic use. Applying this proportion to the total quantity supplied daily in the month of September, 1874, it may be estimated that about 99,114,191 gallons were used for domestic purposes, or about 27·2 gallons per day for each inhabitant, against 27·2 in the corresponding month of last year. This proportion varies from month to month, but the Registrar-General has no means of giving a more reliable estimate.

Companies.	Number of Houses, &c., supplied in Sept., 1873.	Sept., 1874.	Aver. Daily Supply of Water in Gallons* during Sept., 1873.	Sept., 1874.
Total supply	505,295	512,825	118,874,212	120,870,965
From Thames	237,072	240,964	62,866,734	61,816,750
„ Lea and other Sources	268,223	271,861	56,007,478	59,054,215
Thames.				
Chelsea	28,270	28,467	8,371,000	8,065,700
West Middlesex	45,041	46,243	9,590,863	9,907,503
Southwark and Vauxhall	79,506	79,786	19,496,752	18,973,822
Grand Junction	34,243	35,144	11,821,919	11,293,245
Lambeth	50,012	51,324	13,586,200	13,576,480
Lea and other Sources.				
New River	121,601	122,464	26,602,000	29,078,000
East London	104,481	106,459	22,655,550	23,357,000
Kent	42,141	42,938	6,749,928	6,619,215

* Including that for manufactures and for various purposes other than for domestic consumption.

Note.—The return for September, 1874, as compared with that for the corresponding month of 1873, shows an increase of 7530 houses, and of 1,996,753 gallons of water supplied daily.

Kent Water-Works Company.—This company have given notice of their intention to give a constant supply of water, from and after the 1st of March next, to a considerable portion of the parishes of St. Mary, Woolwich, and St. Nicholas, Plumstead.

COMPULSORY PURCHASE OF GAS AND WATER UNDERTAKINGS.

[A speech delivered by Mr. Denison, Q.C., before a committee of the House of Lords on Thursday, April 22, 1874, on the Neath Corporation Bill.]

Mr. Denison: I think I had better begin the water opposition with a speech, although there are many cases in which it is desirable to postpone one's speech. This case is not one of them, and there is a particular reason why I should not postpone it—that is, when one of the main objections to a bill is, as it is admitted that it is, without precedent, and further also that my friend has not established any peculiarity in this case to justify you in making it a precedent. I think that is a point that one ought to bring before you at once, instead of waiting till the end of the evidence. Now, let me make a few remarks upon that. My friend, who opened the case yesterday, put the matter as favourably as he could for himself, and he said this was a proceeding which was somewhat new. I said you may leave out the word "somewhat," and he left it out. Throughout the proceedings all my friends have been obliged to admit that they have no precedent for it. But I admit, on the other hand, there are cases in which precedents must be made. Of course, there may not be precedents for two reasons—first, that people might have tried to do things of this kind and have failed, or they might never have tried, and if they have never tried perhaps it would not come to much if it had never been done. The absence of precedent is not for want of trying; the thing has been tried over and over again. You know that one failure of such a kind as this gives the *quietus* to such attempts for a good many years. Now, I can tell you of two or three conspicuous ones. In the town of Sheffield, three or four years ago—I cannot tell you the exact time now, but a few years ago—the same thing was attempted, and that was a singularly strong case, because there had been great difficulties, as some of your lordships may know, in the case of the Sheffield Company. They had a famous bursting of a reservoir, and there were all sorts of difficulties. The corporation came before Parliament offering, as it were, to relieve the water-works company from their obligations.

The Chairman (Lord Hanmer): To rebuild the reservoir?

Mr. Denison: They would have taken everything upon themselves. The town would have taken upon themselves to rebuild the reservoir, but that did not tempt the company, and, what is more important, it did not tempt the committee. I remember in that case the committee threw out the bill, without my saying a word upon it, upon the mere ground of principle, and of the corporation having established no such peculiarity in the case as would justify them in breaking in upon the principle, and it was rejected at once. That gave a *quietus* to such attempts for some time. If your lordships would like to know more about it, I can tell you it all.

By a Lord: Do you remember the date?

Mr. Denison: 1864 was the date of the smash. There was a bill brought into Parliament to enable the company to raise their rates a year or two afterwards. But still the thing did not go on; it takes a long time to rebuild reservoirs; and I should say, speaking at a guess, it must have been about 1867 or 1868 when this bill was brought in by the corporation.

Mr. Michael: I think it was later; it was 1871.

Mr. Denison: And it is memorable for another thing, that the expenses that the corporation were put to in that case led to the promotion of the bill which is commonly called Mr. Leeman's bill, to enable coporations to recover the costs of the promotion of bills of that kind; but nevertheless the committee, as I tell you, disposed of it summarily, and the corporation, or some of the members of it, had to pay all the costs. When Mr. Leeman's bill was brought in, it had a retrospective clause to relieve the Corporation of Sheffield and the Water Trustees of Edinburgh, who had got into the same difficulty; but your lordships, in the House, in public struck out those retrospective clauses. Now, my lords, I may tell you of another case in the neighbourhood of Sheffield—where the same thing was attempted—Rotherham, which is near Sheffield. The Corporation of Rotherham, or the Board of Health of Rotherham—I believe then the Board of Health—brought in a bill to enable them to acquire the gas-works at Rotherham, and I happen to have here the minutes of what took place. It was attempted to be done upon arbitration, and what was the result? They rejected it so far as it was an arbitration bill, and they required the Board of Health—I will call them the corporation for shortness, because they became so afterwards—to pay the gas company, if they thought fit to take their works, 24 years purchase upon the statutory dividends, that is 247 per cent., because the statutory dividends were 10 per cent. And that was not all, because before we came into the House of Lords with the bill, the corporation found it was necessary to make a further concession. The result was, the company was satisfied by the further concession, and that bill was passed as an agreed bill by this House. The bill was, if they did not make up their minds to do the thing within a limited time, and to purchase at the 247 per cent., then they were to give a still higher price. That was an express rejection of the principle of arbitration. I will tell your lordships another instance of a most decisive character, for companies are afraid of the costs of arbitration. I know we have

Mr. Thomas here thinking that we shall get too much. I have had some experience of arbitrations by consent, not compulsory. There was one at Dundee. I hear my friend say "No." I cannot help that. The costs of that arbitration I am almost afraid to state. I have heard it stated pretty often, and it will be stated, if you think fit to go into the evidence. I believe I am not exaggerating when I say that the costs were £40,000, or something like that.

Mr. MICHAEL: £30,000; it was an enormous undertaking. It was the longest arbitration that had ever taken place. It took twelve months. I am afraid to say what the amount was. It was some £90,000 in annuities, or something of that kind, which were granted; it was an enormous sum.

Mr. DENISON: I do not know why it should take so long, because it was an enormous sum.

Mr. MICHAEL: There were two undertakings.

Mr. DENISON: When in Parliament they thought they could settle the matter with the corporation by agreeing to settle it by arbitration. I have something more to tell your lordships, which Mr. Hawksley, if he comes here, can tell you more emphatically than I can, that the arbitrator there awarded a very great deal less than the company had been receiving. Mr. Thomas, I must repeat, although he is a co-opponent of the bill, seems to think that the arbitration would give too much, and would thereby throw an undue burden upon the town. I am not afraid to run any risk of that kind. In the only case where there has been an arbitration of that sort the result was that the unhappy shareholders got a very great deal less than they had been receiving before. Now if that is not confiscation, I do not know what it is. It could not be called otherwise than confiscation there. There has been no single instance where a company charged by Parliament with a duty, and with corresponding advantages, has been made to give up its property upon arbitration terms. We all know perfectly well that landholders have to sell their land for railways, if it is worth while arguing about such an apology. And why is it? If it were not so, the few remaining landholders not bought early might stand out for a million of money. It is known that most people are ready to sell their land on some advance upon the market price. If there are not means of compelling people to sell, the result would be that three or four might get an enormous price because they were left to the last—in other words, a railway cannot be made without compulsory powers; but Neath can have water without compulsory powers, and therefore they need not be granted. I say if this matter were sent to arbitration, and if the arbitrator through any kind of miscarriage made anything like the mistake which the company thought had been made at Dundee, all these unhappy people that are now getting a rising dividend up to the maximum dividend would have their property confiscated. For what? So that Mr. Kempthorne and his friends might make a clandestine borough rate. He says, "Here is a fine opportunity of making property by buying the water-works at something less, and thereby getting the profit that the shareholders are entitled to." I have told you all I know. I said there must necessarily be a few such cases. It is now several years ago—1870, four years ago—since the last attempt was made. In those four years I do not think there has been any such attempt, because people have been quieted by that Rotherham case. There are four years now gone, and therefore they say we will try again. It is not corporations only, but every now and then the Government has tried it, and what has happened to them? In 1844, so long ago as that, the Government of the day—Sir Robert Peel's Government—thought that inasmuch as railways were becoming very profitable, it might be a good thing to secure to the Government the means of taking the railways, and a bill was brought in to enable them to do it. The committee sat for a long upon that bill, and what was the result? Why, that the Government can buy a railway when it has paid 10 per cent. for three years, and must give for it 25 years purchase upon the 10 per cent.; practically the same as at Rotherham, although Rotherham was 24 years purchase; much the same as is generally agreed to between gas companies and water companies and corporations. At the beginning of every session I have to advise upon sundry such cases—in fact, that has been established since 1854 as the proper price upon which people are to agree for the sale. The principle of it is very simple. If shareholders have not been doing their duty, there are means to make them; but they have a right to get up to the maximum dividend of 10 per cent. Then somebody says it is for the public benefit to buy your works; and then, perhaps, they agree. In the case of railways, Parliament has said it is quite right it should be so, but you must not reduce the income of these people; and the only way to do so is to estimate it at 4 per cent. You cannot get a safe investment at 5 per cent.—you may get a risky one at 5 per cent.—and, therefore, Parliament has established 4 per cent., with the 25 years purchase which any public body are to give in order to secure to the selling body the same income. I have no instructions to say whether we would have taken that or not, because we have never had the opportunity of saying. They asked us in 1868, "Will you sell?" It is the anxious party who makes the bid. When a man keeps a shop, and is anxious to sell his goods, he tickets them in the window. I think you will remember the mayor's evidence. In 1868 we said, "If you want to buy, tell us what you want to give. You cannot ask us to name a price, because we do not want to sell." You have heard they have made that ridiculous offer of £15,000 for a concern upon which £10,500 has been spent, and on which we have the right of earning, as soon as we can, £1050 a year, because we have a right to earn 10 per cent. on a capital of £10,500. I am throwing out the bond debt, because that is immaterial for the present purpose, though not immaterial for what I will say next. If I understood the figure yesterday, the £15,000 was to include £1300 debentures. If I am wrong, somebody will tell me so. Now, that would reduce the amount for the shares to £13,700. Turn that into 4 per cent., what does that come to? £548 a year. Is £548 a year to be paid for a concern which is rising steadily, and which has the right to earn £1050 a year? We have a statutory capacity, and eventually, if these gentlemen are right about the increase of Neath, we have a practical capacity of getting up to 10 per cent. upon all our capital. I know we have not spent it all; but we have a right to spend it all. We have a right to call up the other capital, and to earn 10 per cent. upon it when we please, subject to our parliamentary duties. Therefore we have a practical capacity for earning £1050 for dividend, and that capacity for earning £1050 for dividend these gentlemen propose to take from us, if they can, by arbitration, for a sum which would reduce us to £548 a year. That is confiscating, as nearly as possible, half of our parliamentary dividend. Did anybody ever hear of such an offer as that? Why do they not go on and make a reasonable offer?

The CHAIRMAN: Now it is under the Lands Clauses Act.

Mr. DENISON: Yes, it is under the Lands Clauses Act—that is to say, it is similar to that which took place in Dundee; that is the only place where it has taken place, and there the experience has been what I have told you.

The CHAIRMAN: That was a voluntary arbitration?

Mr. DENISON: That was a voluntary arbitration. The arbitrator, as you know, gives no reasons, and what may happen here may be the same thing. You cannot tell what they may do; they may bring a heap of engineers to swear exactly the contrary to what is admitted now, to say that one thing or other cannot be done, and that we cannot earn these dividends. There is no limit to what people swear upon points of science. Science is said by some people to be most certain, but, practically, we know it is most uncertain. There is an established rate of payment at which concerns are to be bought, if bought at all, by agreement, but they have steadily refused to offer that to us, and have offered this ridiculous sum instead. Now, going on with precedents, I will tell you of a much later one. What the form of the bill in 1844 was I do not know, I only know the result of it; but I do know about this. I know that Government has three times attempted to give to the Metropolitan Board of Works power to buy up the London water companies.

The CHAIRMAN: The established rate is 25 years.

Mr. DENISON: The established rate is 25 years. There was a little difference in Rotherham, because if they did not give the notice within six months they would have to pay 25; but if they did give it within six months they were let off with a year less.

The CHAIRMAN: Your case may be assumed in these words, that there is an established rate of compensation for these things, which prescribes 25 years purchase.

Mr. MICHAEL: I do not agree to that.

The CHAIRMAN: That, and not arbitration under the Land Clauses Act, is the right thing.

Mr. DENISON: That is the right thing, if the committee should come to the conclusion that this is a case for sale. I am not going to that yet. I was going to say that the Government has three times over brought in bills for enabling the Metropolitan Board of Works to take the water companies of London. The first, I think, was in 1852; I do not remember the date of the second, I think it was 1868. That brought in the gas companies, too. 1868 was also gas; that was tried two or three times over. I might have added to my number. I find that the attempt in 1868 had been made before in 1867, and in a certain way it had been made in 1866. There was a general committee that sat upon it. There were a lot of bills brought in—I forget how many—several of them which involved this principle of compulsory purchase, but they all came to grief. In 1851—I said in 1852, but I ought to have said in 1851—that portion of the bill that was brought in by the Government was abandoned, after long inquiry. The inquiry was so long that they could not pass it in 1851, and in 1852 a bill was passed for regulating the water companies, instead of purchasing. They did not attempt purchasing again. Then in 1871 there was a large inquiry about the water companies, and I remember the present Speaker of the House of Commons was chairman of that committee. The Government brought in a bill which contained powers to purchase, and they dropped it again. Those were failures on the part of the Government. And I have one more instance. About the same time the Government brought in a bill for purchasing all the telegraphs. That was in 1868. I remember it was just before Lord Derby went out. They brought in that bill to purchase the telegraphs at the market price of their shares, and it was laughed out of court almost before the bill even appeared upon the table of the committee, and almost simultaneously with that appearing upon the table of the committee; I, who represented one of the companies, had to announce that the company had agreed upon terms. Do not run away with the first figure I am going to give you—20 years purchase. Twenty years purchase upon what? Upon the profits made, not on the dividends. Now, it so happened that the principal telegraph companies, for reasons of their own, had not divided their maximum dividends. They were accumulating a large fund, and, as it turned out when the arbitrator got to work, it was 27 years profits instead of the dividends. The principal telegraph companies got 270 per cent. for their shares under a voluntary arbitration, and by the arbitrator agreed to by the Government, the Government having attempted to get them on easy terms in the first instance. There was, besides that, another curious incident in that case—in all the companies there was a sum to be given for 20 years purchase of prospective profits. That I happen to know something about. I was engaged in an arbitration with respect to one of those companies for the Government, although I was afterwards against them. As you know, I could not be on both sides. It was Reuter's Company, who had raised £123,000 just before the bill was in Parliament; they could not have their profits estimated upon the past, because they had no past; they could only have it on the experience of a single month, and do you happen to know what they got? £750,000—20 years estimate of their prospective profits. I do not think I need go further to satisfy your lordships upon that subject. At any rate, the principle of taking by force upon any towns has never been sanctioned by a parliamentary committee or a public committee. I know that result in Reuter's Company was totally unexpected; and probably, if they had known what it would work out, the Government would not have made that bargain. That is only one instance; the larger ones are embraced in my former remarks—it was 20 years upon the profits they had earned and not divided, and that turned out to be 27 years purchase in some and 28 years purchase in other companies. There are a series of precedents, beginning in 1844 with the Government bill, and ending in 1868 with the Government bill. You may carry it on to 1871, when the Government brought in that bill to deal with the water companies in London, and were obliged to drop out of it the compulsory purchase clauses. Compare the water companies in London with this Neath Water Company. The water companies in London were restricted, not having done all that the Government thought they ought to have done, and, accordingly, new regulations were imposed upon them. In 1872 the obligation was imposed upon them, because they did not go high enough up the river, of going above Teddington Lock; and they were obliged to filter and cover their reservoirs. That is the way with which Parliament has dealt with gas and water companies, not by making them sell, but by imposing obligations upon them. Now, all companies are obliged to come to Parliament from time to time for this very simple reason, that, as towns increase, more works have to be done, and they have to come to Parliament for more capital, and then corporations come and say now is the time for putting them under restrictions, and they are put under restrictions; and if these people are right on the other side, the time will come before long when we shall have to come to Parliament for more money, and when we do, all they will have to do is to oppose the bill, and say, "As you are coming for more money, we must take care and oppose the bill." That is the way in which Parliament has made up its mind now, for years, to deal with public companies; and, in point of fact, they find they get much better control in that way over the water and gas supply, than by leaving it to the corporations to make an indirect profit out of the water supply. I know at Manchester, and at a variety of places, where, from the beginning, the gas-works, and, in some cases, the water-works, have been under the control of the corporation, they have been allowed to keep the profits—I have heard the town-clerk of Manchester say over and over again, "We have done hundreds [of thousands worth of public improvements out of the gas profit." That is what they want to do at Neath. That is not the way Parliament thinks corporations ought to manage their affairs. That is indirect taxation; it is taxing one set to pay for another set. They think that, when public works are to be done, the ratepayers ought to have a voice in it, and say whether it is proper or not. If they want a town-hall, they ought to go to the inhabitants and say, "Let us levy a rate;" but what Mr. Kempthorne and his associates want to do is to have the incidental profit, as he describes it, from the water and gas companies, to do what they like with. He says, "The corporation property now is very small, and it would not increase unless they take steps to acquire more. Are they to be satisfied to allow the profits of these companies to go into private pockets, or are they to acquire them themselves, and thus get into their own pockets the profits which should be devoted to lessening the rates or improving the town." That is the poor-rate, not the water-rates. Again, look at that. Supposing we get to our 10 per cent., as we shall probably very soon, what must happen? We must reduce our rates by Act of Parliament. They must not. They can do as they like; no human being can compel them to reduce the water-rates, so that there will be all kinds of taxation established between the country parties and the town parties, and no party will be able to say he thinks it unjust, whatever it may be. Now, my lords, I said I would proceed to inquire whether any peculiarity is shown in this case to justify my friend in

asking for what he admits to be a totally new precedent; and I do think your lordships will require a pretty strong case, after all I have told you, before you will make a new precedent. It may be that the company are grossly mismanaging its affairs.

The CHAIRMAN: Is there any power to make an offer?

Mr. DENISON: Yes, there is plenty of power.

The CHAIRMAN: Will the corporation make that offer?

Mr. MICHAEL: I do not know whether they will or not; I am quite ready to make an offer.

The CHAIRMAN: It will cut the matter short. I may tell you the opinion of the committee is, as far as regards the water company, to take it out of the bill, therefore they wish to know if you are prepared with an offer.

Mr. MICHAEL: I must ask your lordships attention to this fact—we are not here upon the basis of the £15,000.

The CHAIRMAN: You are going to the Lands Clauses Act and the arbitration. Mr. Denison has shown us what the possible result of arbitration may be, and we do not think that is fair.

Mr. MICHAEL: I could tell you a good deal about arbitrations, which I am afraid you would not listen to. Mr. Denison has chosen for his own purpose to adduce that one of Dundee.

The CHAIRMAN: If there is a usual rate, and a manner and mode of doing these things, that ought to be abided by.

Mr. MICHAEL: I challenge my friend to say whether this is not the usual rate. The usual rate, when a company, either gas or water, has no parliamentary power, is 16¾ years purchase upon the amount of profit earned in the last year, if there are no exceptional circumstances; but if it has parliamentary power, then 20 years purchase upon the profit. It has nothing to do with dividends earned by the company, or with such dividends as can be earned in perpetuity. Now, we are willing to go beyond that. I am authorized to make the offer to my friend of £20,000 for the undertaking of the company—that is, the Neath undertaking.

Mr. DENISON: This is not an arbitration committee; you have made the offer, I will not now tell you whether I accept it or not, but I will do some figures.

Mr. MICHAEL: Allow me to do mine first, and then you may answer them.

Mr. DENISON: You have the power to settle this matter out of this room.

The CHAIRMAN: What I wish to convey to the parties is this—if it is the fact, as I take it from Mr. Denison, that there is an ordinary and accepted rate, that rate should be adhered to.

Mr. DENISON: You need not take it from me; you have heard the Acts of Parliament.

The CHAIRMAN: If the parties are willing to deal in that manner, then the committee might go on with the bill so far as regards the gas, otherwise I do not think they would.

Mr. MICHAEL: We are willing to enter into negotiations with my friend. I now offer him £20,000.

Mr. DENISON: £20,000, you can see in one moment, invested in any kind of securities, will not produce the income; it is only 20 years purchase. The established price is 25 years purchase.

The CHAIRMAN: If it will not produce the income, there is an end of it.

Mr. DENISON: Why should I sacrifice the means of the small people down at Neath? What business have I to say that I will sell their interest, and they shall have so much less income?

Mr. MICHAEL: The income derived by this company during the last year was £766 3s. 7d. Four per cent. on £20,000 is £800; we offer that as against £766.

Mr. DENISON: You know perfectly well, if you leave things alone, we shall be receiving £1050 in a short time.

Mr. MICHAEL: You have never earned it yet.

Mr. DENISON: Of course everything must have a beginning. All small companies must go through a period of youth. People invest their money in these things because they know, if they live through a period of youth, they will come to a period of 10 per cent. profit; and any one would be simply cheated if, putting his money into these things upon a parliamentary guarantee of 10 per cent., corporations are to strike in at a certain time, so that he shall not have that 10 per cent.

The CHAIRMAN: I only do it for the purpose of saving time. I know that the majority of the committee are of opinion that this bill ought not to go forward upon the offer which has been made of £15,000, or upon the arbitration. If you make any other definite offer, and can settle it among yourselves, we shall be content. As I said before, so far as I am concerned, I entertain a strong opinion of the injustice of overbearing people intervening. I think that if the corporation are trying to take, by compulsory power under an Act of Parliament, property from a private company, they may do the same with any private individual. I do not think it is at all a good precedent to follow. I dislike it very much, and I am entirely against that sort of thing. However, if you can settle it among yourselves, well and good.

Mr. MICHAEL: I have offered £20,000.

Mr. DENISON: And I refuse £20,000.

Mr. MICHAEL: I am not authorized to go any further.

The committee-room was cleared. After some time, the counsel and parties being called in,

The CHARMAN: The committee have come to three resolutions, and they think, by indicating their opinion in this manner, they will serve all parties. Two of the resolutions apply to the water, and the third applies to the gas. The first resolution with regard to the water is this: "That the provisions of the bill be amended by rendering the compulsory sale of the water-works to the corporation conditional on the non-execution by the water-works company of certain works within a certain time, to be hereafter specified, necessary for an improved supply of water to Neath." No. 2 is: "That the price to be paid for the water-works under the compulsory powers should be stated in the bill." That is as regards the water. Then the third resolution is with regard to the gas. We think "that the agricultural and rural part of the borough should not be called on to contribute to a gas-rate so long as no gas is supplied to them."

RURAL SANITARY REFORM.

A General Meeting of the Farmers Club was held on Monday evening, Nov. 2, at the Salisbury Hotel, Salisbury Square, London—Mr. E. M. MAJOR-LUCAS in the chair—when a paper was read, entitled

"OUR VILLAGES; THEIR SANITARY REFORM."

By Mr. JAS. HOWARD, late M.P. for Bedford.

He commenced by remarking that although the Farmers Club had already discussed the great subject of the sewage of towns and cities, it had, singularly enough, never once turned its attention to the more home question of village sewage and the sanitary condition of our rural population therein involved. He would not take up time in attempting to prove that our villages stood greatly in need of sanitary reform, for all would admit that a state of things existed in many, if not most, of our villages, which a civilized community must deplore, and would gladly see remedied. His object in bringing the subject forward was to enforce the maxim of Franklin, so prominently introduced to the public by the Prime Minister himself—that the "public health is the public wealth." The speaker then proceeded:—

"With regard to the villages in England, we must admit the fact that a state of things exists in many, nay, in most of our villages, which, as members of a civilized community, we deplore and would gladly see remedied. I happen to reside in one of the best cared-for counties in England. The Dukes of Bedford have, during the past 30 years, erected many hundreds of convenient and handsome labourers cottages; they have also carried out a variety of sanitary improvements upon their estate; their efforts to raise the labourer's condition have stimulated other proprietors, many of whom, I am glad to say, have followed their example, and yet what do we find to be the state of things in many of the villages of this highly-favoured county? If time permitted, I could, from the reports of the medical officers to the rural sanitary authority, give a catalogue of facts and scenes as appalling and revolting as any to be found in Mr. Culley's or Dr. Fraser's (the present Bishop of Manchester) reports to the late Government. Whole villages almost devoid of water, and dependent upon ponds and holes made by the roadside; families herded together in wretched houses unfit for human dwellings, without drainage or privy accommodation, and with foul middens at their very doors. Writing of overcrowding (against which evil, as I shall hereafter show, the law has not provided a remedy) the medical officer of the northern division of the county of Bedford states, 'It is a common thing to find a married couple with five or six, and even seven or eight sons and daughters of all ages, sleeping in one, or at most two small rooms, without any chimney or efficient means of ventilation. I have often, in the course of my professional work, been called into these rooms at night when the greater part of the family have been in bed, and when the state of the room has been sickening.' Having alluded to such conditions militating against health, morality, and common decency, he concludes, 'No more fertile source of the scrofulous diseases which are the scourge of our population can be conceived.' Until the passing of the Public Health Act, 1872, the various Sanitary Acts, so far as rural districts were concerned, were all but a dead letter and useless. The Act of 1872, which, I may remark, was passed with the general concurrence of the public, although deficient in many particulars, was most important in this particular—it rendered the action of local authorities compulsory, so that most of the evils which exist can no longer be shirked, but must be dealt with in some way or other."

Mr. HOWARD then proceeded to deal with the question of the water supply, and he contended that the rainfall, properly cared for, might be made to give the needful supply in dry summers. He demonstrated that reservoirs, safe from sewage contamination, were easily and cheaply constructed. He drew particular attention to the plans recommended by Sir Philip Rose in his letter to *The Times*, and to what had been done by Sir Anthony Rothschild at Aston Clinton, to provide water for his cottagers, who highly prized the gift.

Proceeding to deal with the question of labourers dwellings, he said he built a block of cottages entirely of concrete. This he had found better than brickwork; it was warm and impervious to wet. Each cottager had three bed-rooms, and the cost of the block was a little over £600.

In dealing with the questions of "drainage, sewerage, and sewage," he explained drainage to be the means of draining off and conveying the water from the soil and surface, sewerage the means of removing refuse in a liquid or partially liquid state. In an assembly of practical agriculturists he said he need not enlarge upon the sanitary advantages of under-draining. The improvements which had occurred in the rural districts by draining away the subsoil and surface water were so manifest as to be universally recognized, if not universally adopted. In his own county ague and fever, 30 and 40 years ago, were very common in certain villages; since draining had been carried out the former had altogether disappeared, and the latter had greatly decreased. In villages there were only two systems possible, the "earth" and the "water." The latter, he considered, in most cases out of the question, not only on account of the expense, but because water-works were essential, though he thought it the more successful and economical on a large scale. In support of the earth system for villages, he again drew attention to what was done at Sir Anthony Rothschild's, and said that the result showed that Sir Anthony, in effecting this system for his villagers, had not made a bad investment.

Proceeding with this subject, the speaker drew attention to a large public question—the pollution of streams. "With respect to water sewerage, I would for a moment call attention to the following typical case from a recent report of the medical officer to the Bedford Rural Sanitary Authority. In reporting his visit to a large village on the banks of a river, after urging the necessity of establishing some general principle in dealing with the disposal of excreta, Dr. Prior, the officer, states:—'I find large drains or sewers in course of construction, the level of the lower portion of which will be 2 feet below that of the mill-head, and which will ultimately empty themselves into the mill-tail. This mill-tail and the mill-head in the next village are not very far from synonymous, and it is not to be supposed that the inhabitants of the latter place can look with complacency upon any scheme for the discharge of sewerage into the stream whence some derive their water for household purposes, and some their drinking water. Moreover, by 11 & 12 Vict., cap. 63 & 80, and 29 & 30 Vict., cap. 90 & 111, the pollution of any stream under the control of the sanitary authority is constituted an offence punishable by fine.

"We are thus immediately brought face to face with one of the preliminary difficulties which beset the application of a system of sewerage to villages; but there are many others so numerous and so formidable that they can only be met completely by a system of water-works and sewage irrigation, if they can be by that. It is therefore with grave reluctance that I should witness the attempted extension of such a system to districts purely rural." I have described this as a typical case, for unquestionably where sewers are made in villages, they, as a rule, empty their contents into the nearest stream. Looking to the certainty that the time is at hand when the public will no longer tolerate the practice of pouring filth into our beautiful streams and watercourses, it will be well that in the case of new sewers they should be laid with a view to the sewerage being ultimately utilized by irrigation; unless this be kept in view, many mistakes are likely to be made in the levels of the outfall sewers.

"The Local Government Board has recently—as I think unwisely—sanctioned the opinion that 'house slops' do not come under the head of sewage, and can, therefore, be discharged into rivers and running streams. Notwithstanding this decision, there is no doubt that the public will insist upon house slops—filthy stuff—being included in the prohibition I have referred to. From conversations with Mr. Bruce (Lord Aberdare), I know that, but for the length of time taken by the Rivers Pollution Commissioners in completing their report, the late Government were prepared to deal with this subject three years ago. Now that we have a Government whose policy is endorsed as a 'sewage policy,' there ought not to be a doubt that it will be effectually and quickly dealt with."

On the question of sanitary laws he said that "one of the chief and most perplexing difficulties arises from the number of Acts of Parliament, partly in existence and partly repealed; also from the mixture in the Acts of urban and rural provisions in such a way as to render it a matter of considerable doubt, to all ordinary persons, what the law really is, and causing much trouble even to experts. The only remedy is the consolidation of the Acts, or a new general Act, repealing all existing Acts, so framed that the provisions relating to urban and rural authorities, to gas, water, &c., shall be separated. The defects in the rural sanitary laws are chiefly manifest in the provisions which deal with water supply, sewerage, overcrowding, and infectious diseases." He pointed out that the power in the magistrates to order water to be supplied to a house, if it could be done at 2d. a week, was not sufficient, and that it was necessary to declare a house which had not a decent water supply, unfit for human habitation. He made a variety of practical suggestions on the other points, and he concluded this part of his subject by observing—"'S. G. O.,' in one of his vigorous letters in *The Times* upon this subject, asked, 'Where is the town or village which has not its influential magnate or magnates?' and argued

powerfully against local control. Grand schemes for sanitary government are being propounded—the country is to be mapped out for the purpose into districts corresponding with its natural watersheds, and other great changes advocated; but if the present rural sanitary authorities will only carry out the Acts with willingness, and a fair amount of determination, such is the fear entertained by the public of being over-governed by sanitary officials, that they may be let alone for many years to come. If, however, an opposite course should be pursued by them, the signs of the times point to a speedy transfer of their powers to other bodies."

In conclusion he said, "I would call attention to the fact that where well-considered sanitary measures have been adopted in towns and cities the advantages to the inhabitants have been so marked that the circumstances should act as a powerful stimulus to exertion in carrying the same benefits to our villages. In the borough of Bedford, where a comprehensive scheme of sewage and water supply was carried out a few years ago, the general health of the inhabitants has greatly improved, and the death-rate has fallen to the very low average of 16·08 per 1000, or about 20 per cent. below the former mortality; indeed, the town of Bedford is now healthier than the surrounding country districts. Again, at Salisbury, it was stated at the recent meeting of the British Association that, in consequence of the sanitary improvements carried out in that city, the death-rate had fallen from 27 in the 1000 to 16 in the 1000. As farmers, we have the deepest interest in rearing a race of men 'strong to labour;' unquestionably the strength, moral and physical, of our peasantry depended to a large extent upon the sanitary conditions with which they are surrounded. There is nothing more certain than that the race cannot improve, but will degenerate, unless the conditions are favourable.

"The subject I shall conclude with is one which I would willingly pass over, but the labour question is one in which the landlord, the tenant, and the labourer, as well as the public, have the profoundest interest, for upon the labour supply the value of land in all countries mainly depends. I am not an alarmist, still I do not think it wise we should shut our eyes to the fact that our colonies and other countries are coming forward in a way they have never done at any former period—in something like an organized form—to bid for our labour, and the competition and the organization both appear to be growing. Danger at present does not appear to be imminent, and it is, perhaps, an idle boast of the emigrant agents that they will drain our rural districts of our best blood; still, it is the object at which they aim, and the movement, disfigured though it is by violent language, may just as well be looked fairly in the face. The natural affection of an Englishman for his home and country is proverbial; but when that home is a wretched hovel, what is there to bind and localize the labourer's sympathy or attachment? How can we, under such circumstances, expect him to withstand the wiles of emigration agents and other interested leaders? Put the same man into possession of a sweet and comfortable cottage, a well-manured garden with its vegetables and flowers, an orchard with a prospective crop of fruit to pay the rent; home under such circumstances is a reality not to be hastily bartered away for the frozen fields of Canada, the plains at the antipodes, or the more tempting prairies of the Far West."

In the discussion that followed—

Mr. HOPE observed that there was a possibility of open reservoirs becoming fouled by fallen leaves, and other decaying vegetable matter, and on that account the plan was not free from objection.

Dr. VOELCKER held a contrary opinion, thinking that the exposure to the air would oxidize everything obnoxious in the water.

Mr. H. K. FOWLER considered that the earth-closet system would not succeed unless the cottagers were well looked after. He believed in "educating" the people into sanitary improvements, and that farmers as a rule were reluctant to spend money upon such schemes.

Mr. TREADWELL also believed in leading the people rather than driving them.

Mr. PELL, M.P., said that, however desirable it might be to adopt the earth system, it was impossible to do without the other, which must be connected with it. The local authority could scarcely undertake the water supply in rural districts, because it would not pay to do so. It was more a matter for private enterprise. Speaking of his own locality, he confessed that many of the people in his district made such arrangements as conduced to generate fever by having a poisonous condition of things about their houses. The plan adopted by his local sanitary authority was to map out a parish where fever arose and lay down sewers. This might be costly, he said, but the great thing for agriculturists to remember was that the sanitary rate, besides being cheaper than the "fever rate" (for fever caused pauperism), fell upon the right persons—the house-owners—while the other, the pauper rate, fell upon the land in falling upon the whole union. Therefore, he said, farmers should press out fever-engendering pauperism. He was inclined to doubt the value of the services rendered by medical officers of health to local authorities. The causes of disease were well known, and they did not need a doctor with £800 a year to tell them. What was wanted was the steady application of sound, practical inspectors and engineers, who would proceed at once to do good sanitary work.

Mr. Neild, Mr. H. Tritheny, Mr. Horley, jun., and other members, also took part in the discussion, which was brought to a close with a reply from the author of the paper, to whom the thanks of the club were voted.

AMERICAN WATER GAS RESEARCHES.

A Report by Professors WURTZ and SILLIMAN.

[From the *American Gaslight Journal*.]

(*Continued from page* 610.)

IV.

CARBON IN THE RETORTS.

It is by no means one of the least advantages incident to the hydrocarbon process that it effectually prevents the deposit and accumulation of solid carbon in the retorts. This evil is one keenly appreciated by all practical gas men, and numerous devices have been adopted, or proposed, to remedy it. In effect, the loss arising from this cause is not less than 8 per cent. of the total efficiency of the number of benches in use, while the labour costs and fuel burned are undiminished.

INCIDENTAL PRODUCTS OF A SALEABLE CHARACTER.

The tar from a series of five benches of five retorts, burning off, say, 9½ tons of coal, will be at 9 gallons per ton, say .	87 gallons.
The ammoniacal liquor from the hydraulic mains by the hydrocarbon process is shown by our experiments (see section on Ammonia) to be very strong, having a strength of 1420 grains of absolute ammonia to the gallon, or, as compared with the strength of the liquor from the same coals by the ordinary process, as 2·29 to 1—nearly 2½ times stronger. Taking the usual estimate of 10 gallons of ammoniacal liquor to the ton of average caking coal, we shall find from 9½ tons of coal, ammoniacal liquor (density 1032)	92½ galls.
Containing of absolute ammonia	18·72 lbs.
Surplus coke available for sale	60 bushels.
The waste lime from the purifiers, say	35 „

It will be seen from this statement that the incidental products by the hydrocarbon process are by no means inconsiderable. It is proper to say, in this connexion, that the value of the tar for the laying of wooden pavements and gravelled walks (its most important use in this country) is increased by the hydrocarbon process, and the residual product should command, therefore, as much money as before—that is, the price per barrel will be advanced 20 per cent. The loss of its more volatile ingredients is an advantage for its use in making pavements.

We have selected a bench of five clay retorts as the term of comparison between the results of the hydrocarbon process and the common process, because it is the form of oven most commonly in use in the United States; and the coals used in illustration, or their equivalents, may be obtained almost anywhere.

At Fair Haven the benches had three retorts each, the upper one being the anthracite retort, which makes a very convenient arrangement for caking coals, with 10 per cent. to 15 per cent. of enriching coals added; but for cannel coals the reverse order is required, as already indicated in the plan described for a bench of fives.

The arrangement of "sixes" is also equally convenient, being the last-named arrangement doubled, with the two upper retorts for anthracite.

The majority of engineers will, in short, adapt the system as their varying necessities may require.

COST OF THE WATER GAS, IF MADE BY ITSELF.

We have given some consideration to this point, which suggests itself as one sure to be of much importance, aside from the use of the water gas in the hydrocarbon process for illuminating purposes; for example, in the use of water gas for heating, cooking, metallurgical operations, and as a motor. The elements of cost are—1, the prime cost and wear and tear of the apparatus; 2, the fuel consumed to heat the retorts; 3, the anthracite consumed to decompose the vapour of water; 4, the fuel required to produce steam, provided the waste heat of the benches is disregarded; 5, purification; 6, labour; 7, administration and incidentals.

With these data it is easy to fill up the following schedule for a bench of five anthracite retorts, holding, say, 600 lbs. of anthracite each, thus:—

Five anthracite retorts set in one bench produce 7000 cubic feet each of purified hydrogen and carbonic oxide gases as the daily product, equal 35,000 cubic feet.

Anthracite consumed in retorts, say, 90 lbs. × 5 = 450 lbs.
Steam fuel, say, 16 lbs. × 5 = 80 lbs.
Lime (4000 feet per bushel), say 8 bushels.
Labour.
Administration, taxes, repairs, &c., say 15 per cent. of all other costs.

Recapitulation.

These data are convertible into values for this place, thus, viz:—	
450 lbs. anthracite at, say, 8 dols. per ton	1·35 dols.
42 bushels coke, 8 cents per bushel	3·36 „
8 bushels lime, 12½ cents per bushel	1·00 „
Labour, say	3·00 „
	8·71 dols.
Add 15 per cent. for administration, taxes, repairs, interest, and incidentals, equal	1·30 „
Cost of 35,000 feet of water gas, equal	10·01 dols.
„ 1,000 cubic feet of water gas (in U. S. currency) . .	0·286 „

This calculation will vary, of course, somewhat with the locality. The labour of one fireman is all that will be required, as there are no bituminous charges to stoke or remove.

The high heating power of this gas has been fully demonstrated by our calculations in the section devoted to that subject, and it becomes, therefore, a matter of considerable practical importance to ascertain, as nearly as may be, its cost. It will be important, when it shall be brought into use as a heating agent, to impart to it a sufficient degree of odour to secure those who use it from any risk arising from its accidental escape. Probably petroleum naphtha may be employed, in small quantity sufficient only to impart odour; and naphthaline is another waste product which may be used for this purpose. Owing to the production of acetylene in the combustion of common street gas, when used for cooking or heating, serious objections have very properly arisen to gas-stoves employed in apartments, as this agent is found to induce headache and nausea. To the use of the water gas alone no such objection can arise, as its sole products of combustion are water and carbonic acid.

PERMANENCE OF THE HYDROCARBON GAS UNDER THE INFLUENCE OF COLD, IN CONTRAST WITH GAS MADE BY THE COMMON PROCESS.

A very natural doubt has existed in the minds of some of our best gas engineers whether the hydrocarbon gas could have the same permanence under the influence of low temperature as ordinary coal gas. Considering the ease with which air, or even poor coal gas which has not been naphthalized, parts with an important portion of its illuminants at a low temperature, it has been argued that the non-luminous substratum of combustible gases, got from water by the hydrocarbon process, would in like manner part company with the illuminants derived from the bituminous coal distillation as soon as the mixture should be powerfully refrigerated.

Experiment—before which all preconceived notions must bow—completely disproves this hypothesis, and we are able to declare most positively that the hydrocarbon gas is far more permanent under the influence of extreme cold than any coal gas we have been able to put to the same severe test.

Let us state the evidence.

1. We had occasion carefully to examine the effect of the exposure of the gas in the holder at Fair Haven to the action of cold weather for a period of three weeks. The facts are as follows:—

From the 28th of December to the 9th of January last the volume of gas remaining in the holder (about 25,000 cubic feet) was exposed to severe cold, the temperature having been as low as 12° Fahr., without sensible loss in bulk beyond the amount accounted for by consumption about the works, and with no loss whatever in its illuminating power. The average of nine days photometric observations, after the gas was thus exposed, showed an illuminating power of 16·21 candles. Refer, for more complete illustration of this curious fact to Table XV., which shows an increase of illuminants, taken up from the saturated water of the tank during the latter part of this period, the illuminating power at the beginning having been but 15·66 candles.

Gas engineers will see that this test of long-continued exposure to cold is of the greatest practical importance, as proving beyond cavil the permanence of the gas; showing that it is not, as has been asserted by some, merely a poor gas naphthalized by the condensable oils of coal tar, and therefore liable to be again impoverished by cold and exposure.

2. Conceiving that the use of a lower temperature might give different results, the gas, on the 23rd of March, made from Westmoreland coal 85 per cent., and Albert 15 per cent., was subjected to refrigeration in a coil of half-inch lead-pipe 50 feet long, immersed in a freezing mixture of ice and salt, at a temperature of 0° to 6° Fahr.

At 60° Fahr. the gas a had candle power of	20·02 candles.
At 0° to 7° Fahr. the gas had a candle power of	18·42 „
Loss of candle power 8 per cent., or	1·60 candles.

In a second experiment the following results were obtained:

At 60° Fahr. the gas had a candle power of	19·38 candles.
At 0° to 6° Fahr. the gas had a candle power of	18·79 „
Loss of candle power 3 per cent., or.	0·59 candles.

Average loss of illuminating power, 5½ per cent.

3. By the kindness of Mr. Sabbaton, the skilful engineer of the Manhattan Gaslight Company in New York, we were enabled to repeat this test with a similar coil in the Eighteenth Street station of that company. The first trial was upon the gas from Peytona cannel.

At 60° Fahr. this gas had a candle power of . . . . . 29·24 candles.
At 0° to 6° Fahr. this gas had a candle power of. . . . . 27·30 „

Loss in illuminating power 6·6 per cent., or . . . . . 1·94 candles.

The second trial was on the street gas of that company on the 24th of March.

At 60° Fahr. the gas had candle power of . . . . . 14·71 candles.
At 0° to 6° Fahr. the gas had a candle power of . . . . . 10·42 „

Loss in illuminating power 41·19 per cent., or . . . . . 4·29 candles.

Anxious to avoid any error in respect to results so unexpected and remarkable, it was requested that the trials might be repeated with great care by Mr. Farmer, their own photometric observer; which was accordingly done, with the following results:

4. Another sample of the gas from Peytona cannel of a higher candle power was used.

At 60° Fahr. in fishtail burner the gas had . . . . 41·16 candle power.
At 6° Fahr. in fishtail burner the gas had . . . . 35·99 „

Loss of illuminating power 12.5 per cent., or . . . 5·17 candle power.

5. The street gas, March 29; tried again—

At 45° Fahr. the gas had an illuminating power of. . 14·05 candles.
At − 6° Fahr. the gas had an illuminating power of . 7·84 „

Loss of illuminating power 44 per cent., or . . . . 6·21 candles.

6. The same gas at + 14° Fahr. lost 12·5 per cent., or 1·77 candles; showing that the great loss in illuminating power was with temperatures below 14° Fahr.

These trials were also extended to the gases from the coals then in use at the Manhattan works, taken separately, with a view to determine whether the loss was chargeable possibly to one more than another of the constituent coals. These were: "Penn," or north-western coal from south-western Pennsylvania (essentially the same as Westmoreland), forming two-thirds; and Cow Bay, Nova Scotia, forming one-third of the mixture in use to produce the gas tried in experiment No. 5 above.

7. March 21; North-Western Coal ("Penn"):—

At 60° Fahr. the gas had an illuminating power of . . . 0·16 candles.
At − 6° Fahr. the gas had an illuminating power of . . . 9·93 „

Loss of illuminating power 38 per cent., or. . . . . 6·07 candles.

8. The same gas tested—

At + 15° Fahr. lost 8·8 per cent., or. . . . . 1·41 „

9. Cow Bay ("Blockhouse Coal"):—

April 5; coal which had been 12 months exposed, and had lost in quality:
At 65° Fahr. the gas had an illuminating power of . . . . 14·99 candles.
At 6° Fahr. the gas had an illuminating power of . . . . 10·91 „

Loss of illuminating power 24·3 per cent., or . . . . . 4·08 candles.

10. The same gas at 15° lost 6·7 per cent., or 1·01 candle.

Still further to test the comparative value of the two systems of gas-making, with reference to the permanence of the products under extreme cold, the experiments were repeated at Fair Haven with the hydrocarbon process upon Blockhouse coal, with 10 per cent. of Albert.

11. Blockhouse coal, Cow Bay, N.S. . . . . 90 per cent.
Albertite, Hillsboro', New Brunswick. . . . . 10 „
At 60° Fahr. the gas had an illuminating power of. . . . 15·83 candles.
At − 6° Fahr. the gas had an illuminating power of . . . 13·54 „

Loss of illuminating power 16·15 per cent., or . . . . . 2·29 candles.

12. Second trial of the same gas:

At 60° Fahr. the illuminating power was . . . . . 15·93 candles.
At − 6° Fahr. the illuminating power was . . . . . 14·02 „

Loss of illuminating power 12 per cent., or . . . . . 1·91 candle.

13. The Westmoreland coal, Pennsylvania:—

At 60° Fahr. the gas had an illuminating power of. . . . 15·06 candles.
At − 6° Fahr. the gas had an illuminating power of . . . 11·39 „

Loss of illuminating power 24·3 per cent., or . . . . . 3·67 candles.

14. The same gas at 15° Fahr. lost 10·6 per cent., or 1·61 candle.

The conclusion to be drawn from these repeated trials is greatly in favour of the superior permanency of the hydrocarbon gas, as compared with gas made from the same coals by the ordinary process.

These results are more conspicuously exhibited in the following table:—

TABLE IV.

Showing the Loss of Illuminating Power in Illuminating Gas by Refrigeration at 15° and 0° to − 6°.

A.—*Gas Made by Ordinary Process.*

Gas Made from	Candle Power at		Loss of Illuminating Power.		Candle Power at		Loss of Illuminating Power.	
	60° Fahr.	0° to − 6°	In Candles.	Per Cent.	60° Fahr.	15°	In Candles.	Per Cent.
Peytona cannel	29·24	27·30	1·94	6·60	..	..	..	..
Peytona cannel	41·16	35·99	5·17	12·5	..	..	..	..
Westmoreland, } Blockhouse }	14·71	10·42	4·29	41·19	..	..	..	..
Westmoreland, } Blockhouse, }	14·05	7·84	6·21	44·0	14·05	12·29	1·76	12·5
N. Western "Penn"	16·0	9·93	6·07	38·0	16·0	14·59	1·41	8·8
Cow Bay, N. S., } Blockhouse, }	14·99	10·91	4·08	27·2	14·99	13·98	1·01	6·7
Westmoreland, Pa	15·06	11·39	3·67	24·3	15·06	13·45	1·61	10·6

B.—*Gas Made by Hydrocarbon Process.*

Westmoreland, 85 } Albert, 15 }	20·02	18·42	1·60	8	*Note.*—No trials were made with the hydrocarbon gas at 15°. But 25,000 feet exposed in a holder for three weeks, at temperatures ranging from 32° to 12°, suffered no loss of illuminant power.
The same coals	19·38	18·79	0 59	3	
Blockhouse, 90 } Albert, 16 }	15·83	13·54	2·29	14	
The same coals	15·93	14 02	1·91	12	

Average loss in illuminating power at zero to − 6° on street gas by common process . . . . . 32·53 per cent.
Average loss in illuminating power at zero to − 6° on street gas by hydrocarbon process . . . . . 9·25 „

Difference in favour of hydrocarbon process (equal 2·63 : 1) 23·28 per cent.

Average loss on Peytona cannel at zero . . . . . 9·32 per cent.
Average loss on New York street gas, old process, at 14° and 15° Fahr. . . . . 9·55 „

In view of these remarkable results, it must be admitted that the hydrocarbon process imparts to the illuminants, which its substratum of non-illuminating gases holds in solution, a degree of permanence unknown in street gas made from identical coals by the common process. We do not here attempt to account for this; but the fact is of the highest importance, and completely removes one of the most plausible of the objections that have been urged against the hydrocarbon process.*

(To be continued.)

AUCKLAND GAS COMPANY, LIMITED.

The Twelfth Annual General Meeting of this Company was held on the 30th of July last—Mr. F. WHITAKER, the chairman of directors, presiding.

The following report and statement of accounts were presented by the secretary (Mr. E. B. Parsons), and were adopted:—

The directors have great pleasure in being able to state that the affairs of the company continue to be in a sound and prosperous condition. The balance-sheet for the year ending the 30th of June shows that the directors are justified in recommending the dividend for the year at the rate of 15 per cent. per annum. Of this an interim dividend of 7½ per cent. was paid in January last, leaving 7½ per cent. to be now paid.

Two directors retire by rotation—Messrs. Stone and Burn—and offer themselves for re-election. Two auditors must also be appointed by the shareholders at this meeting.

General Balance, for the Year ending June 30, 1874.

Dr.		*Cr.*	
3800 original shares of £5, all paid up	£19,000 0 0	Freehold land	£1,482 3 9
200 original shares, sold at a premium	1,976 5 0	Freehold buildings and plant, including mains and meters	30,674 3 6
1900 new £5 shares, sold at a discount	4,977 5 8	Stock of coal, &c.	539 0 0
100 new £5 shares, sold at a premium	1,000 0 0	Stock of residual products	257 19 10
		Amounts due to the company	361 0 9
Total received from shareholders	£26,953 10 8	Cash in the Bank of New Zealand	797 3 2
Additional sum taken from income, expended in completing works	3,256 5 1	Cash invested in Government debentures	1,034 0 0
Amount owing by the company	127 18 1		
Dividend unclaimed	38 12 6		
Cash at call	1,019 4 8		
Reserve-fund	1,500 0 0		
Profit and loss	2,250 0 0		
	£35,145 11 0		£35,145 11 0

Profit and Loss.

Coals, &c., carbonized	£3,000 5 3	Gas	£9,860 2 3
Stokers wages	569 3 6	Residual products	1,080 2 5
General Expenses—		Interest	50 5 6
Directors and auditors fees	250 0 0	Scrip and transfer fees	3 4 0
Insurance	8 5 0		
Salaries	908 0 0		
Stationery, printing, advertising, and stamps	86 1 1		
Rates and taxes	51 7 6		
Petty cash	18 19 3		
Legal expenses	6 19 0		
Rent	164 0 0		
Inspecting meters	64 15 0		
Government licence	15 0 0		
Mains, service-laying, &c.	434 0 7		
Wear and tear	948 7 6		
Bad debt	24 15 6		
Balance down	4,443 15 0		
	£10,993 14 2		£10,993 14 2

By Balance at credit, June 30, 1873	£2,193 15 0	
Balance brought down	4,443 15 0	
		£6,637 10 0
Dividend declared on July 28, 1873, and interim dividend, Jan. 19, 1874		4,387 10 0
		£2,250 0 0

BIRMINGHAM WATER SUPPLY.—Dr. Hill, the Medical Officer of Health for Birmingham, again reports most unfavourably of the water supplied to that town during October. The water, it is said, was "pretty clear," but there was "a sudden rise in the total solids, and the organic nitrogen continues very high."

RYDE TOWN COUNCIL.—RE THORNTON ANDREWS'S CASE.—At the meeting of the Corporation of Ryde on the 31st ult.—Alderman Dickson, chairman, *pro tem.*, stated that he had a rather unpleasant letter to read from their solicitors, addressed to the mayor, and intimating that an execution was to have been put in the town-hall upon the goods and chattels of the corporation for the amount of the judgment obtained against them by Mr. Thornton Andrews, for professional services rendered by him on the arbitration in reference to the proposed purchase of the gas-works. The letter having been read, the Finance Committee's report was brought up. It appeared that the amount claimed by Mr. Andrews was £194 5s. 1d., but the costs incurred brought up the sum to £382 8s. 1d., in addition to which there was a Mr. Blake's bill of £44, and other items, making the total £432 9s. 5d. Mr. White: Why did you not pay the £194 5s.? The Mayor, who had entered the room, said the old corporation defended the claim. Mr. White: Merely because they could not pay them. The Mayor: That's a most extraordinary way of defending an honest claim. This corporation had never attempted such a thing, and no corporation of credit would. Mr. White: It was merely to gain time. The Mayor: Then all the other arguments as to defending the claim on other grounds are utterly false and futile? Mr. White: I do not know about that. I merely stick to this. Alderman Dickson said there was £382 8s. 1d. to which they were indebted for taxed costs, but he must ask them to vote more, as there would be the sheriff's expenses. The Mayor: No; you need not trouble yourself about it. It is not at all likely. It is all nonsense. Still you might make it £390. Mr. White said, as to Andrews's action, there was an appearance entered with the writ, and, if he remembered rightly, they had no money at the time. The Mayor: But pleas were prepared, and Mr. Bullen was engaged. Mr. White said he believed the object was to gain a personal interview with Mr. Andrews, so as to come to an arrangement for a reduction of his charges. He gave good evidence, and the regretable part of the affair was that the money was not paid. The Mayor said he had always said that professional men ought to be paid according to their merits. Mr. Knight said if Andrews's action had been properly defended it would have been defeated, although the gas actions had not been. They disputed this on the ground of excessive charges, and now said he was a good man. After some conversation the motion was put and carried.

* A considerable number of additional results upon this subject have been obtained, but as they serve only to confirm the statements made in the text, the details are reserved for another occasion.

MANCHESTER CORPORATION GAS-WORKS.

Report of the Gas Committee for the Year ending June 24, 1874.

The Gas Committee present the following report:—

Your committee submit an abstract of the accounts of this department for the year ending June 24, 1874, also the usual tabular statements.

Appendix A shows the amount of lamp and private rental derived from the townships within and beyond the city respectively for the past two years.

Appendix B, the quantity of gas transmitted from the works in the daytime, and during the whole 24 hours of the day in each month for the same period.

Appendix C, the number of meters in use on the 24th of June, 1873 and 1874, respectively.

Appendix D, the main-pipes laid to the 24th of June, 1873, and those laid and taken up during the year ending the 24th of June, 1874.

Appendix E, the amount of profit and the mode of its appropriation, the amount of borrowed money owing, and the excess of assets, &c., in each year from 1862 to the 24th of June last.

The rental for the past year (including meter-rents) has amounted to the sum of £296,000 12s. 7d., being an increase of £23,240 4s. 9d. upon that of the previous year.

The amount of profit is £77,465 12s. 2d., as against £63,603 0s. 6d. in the previous year, and is appropriated as follows:—Interest, £18,861 13s. 3d.; transferred to capital account towards liquidation of the mortgage debt, £28,977 9s. 6d.; surplus to be paid over for improvement purposes, £29,626 9s. 5d.

In addition to the sum of £29,626 9s. 5d., the amount of the surplus profit, the further sum of £183 9s. 4d. will, in accordance with the arrangement sanctioned by the council on the 4th day of March, 1868, be paid over for improvement purposes, in anticipation of future profits, making together the sum of £29,809 18s. 9d.

The number of consumers has increased 2·62 per cent., amounting now to 65,979, as against 64,293 the previous year.

The quantity of gas supplied has been less than that of the previous year by 4,227,000 cubic feet, or ·23 per cent.

Your committee also submit the reports of Mr. John Leigh, the consulting and analytical chemist to this department, and Mr. George Nesbitt, the accountant appointed by the council to audit the accounts for the past year:—

"*To the Chairman of the Gas Committee.*

"*Officer of Health's Department, Town-Hall, Manchester, Oct.* 2, 1874.

"Sir,—I have the honour to report to you that the average illuminating power of the Manchester gas during the past year has been equal to that of 18·54 London standard candles.

"The gas has been tested photometrically at the Gaythorne and at the Rochdale Road stations almost daily. The standard of comparison adopted has been the light of a London standard sperm candle burning at the rate of 120 grains per hour, the consumption of the gas having been reduced to 5 cubic feet per hour.

"The gas has been tested daily for sulphuretted hydrogen and for ammonia. It has also been allowed to flow continuously through test solutions, and the amount of impurity in large volumes of the gas has been determined. As the gas has passed through these solutions during each night, and during Sundays as well as on ordinary days, any negligence in purification at these times would have been detected.

"To the daily tests the gas has very rarely yielded any traces of sulphuretted hydrogen. From the large volumes flowing through the test solutions (from 100 to 600 cubic feet) rarely has any of this impurity been separated, and in any case not more than a fraction of a grain.

"The quantity of ammonia in the gas has ranged between 2-10ths and 12-10ths of a grain in 100 cubic feet. Frequently the quantity has been inappreciable.

"The gas has been generally free from naphthaline and from oily and tarry matter.

"The quantity of sulphur existing in the gas, in combination with carbon, as bisulphide of carbon and organic sulphur, has been very variable; it has, however, seldom exceeded 22 grains in 100 cubic feet of gas. The general range has been between 11 grains and 19 grains.

"The Gas Committee have made arrangements for the construction of a large condenser between the hydraulic main and the washers and scrubbers, which will allow of the application of improved means of reducing the amount of bisulphide of carbon.

"I have the honour to be, sir, yours respectfully,

(Signed) "John Leigh, M.R.C.S."

"*To the Gas Committee of the Corporation of Manchester.*

"19, *Mount Street, Manchester, Oct.* 15, 1874.

"Gentlemen,—The audit of the books and accounts of your gas department, including the Droylsden station, for the year ending June 24, 1874, has been completed.

"The statements of receipts by the collectors, and the authorizations for cash payments by the Finance Committee, with the vouchers in relation thereto, have been examined; the bank pass-book has been compared with the cash-book entries, and the postings to the several accounts in the ledgers have been carefully checked.

"I have also examined the accounts of profit and loss, of income and expenditure on both capital and revenue, schedules of liabilities and assets, and the general balances, all of which I have much pleasure in certifying to be correct.

"Very faithfully yours,

(Signed) "Geo. Nesbitt, F.M.I.A."

The expenditure on capital account has amounted to £27,440 14s. 8d., the particulars of which are given in the summary of receipts and expenditure, and in the statement of assets and liabilities.

On behalf of the Gas Committee,

John King, jun., Chairman.

Gas Offices, Albert Chambers, Albert Square, Oct. 16, 1874.

Dr. — *Profit and Loss Account, for the Year ending June* 24, 1874. — *Cr.*

To Cannel					£167,466	17 9
Retort men's wages					26,577	3 7
Retorts, materials, and setting					6,986	10 2
Purifying charges					5,074	5 9
Labourers wages, and repairs, &c., of works—						
Gaythorn station		£8,260	16 8			
Rochdale Road station		7,093	15 0			
Street-mains		8,402	3 1			
Droylsden works		157	0 4			
Repairs of hired meters		292	8 11			
				24,206	4 0	
Salaries				9,582	16 0	
Collectors poundage, &c.				4,792	6 5	
Chief and other rents and rates, &c.—						
Chief rents		£387	17 7			
Rates and rent of offices		725	16 8			
Rates on stations and street-mains		6,030	8 2			
				7,144	2 5	
Income-tax				811	9 0	
Amount transferred to capital account for depreciation of works—						
Gaythorn station—						
4 p. ct. on buildings (£73,273 13s. 11d.)		£2,930	18 11			
5 p. ct. on apparatus (£46,610 19s. 1d.)		2,330	11 0			
				£5,261	9 11	
Rochdale Road station—						
4 p. ct. on buildings (£114,990 16s. 0d.)		£4,599	12 7			
5 p. ct. on apparatus (£65,694 9s. 1d.)		3,284	14 5			
				7,884	7 0	
Droylsden works—						
4 p. ct. on buildings (£6792 12s. 0d.)		£271	14 0			
5 p. ct. on apparatus (£7113 5s. 5d.)		355	13 3			
2½ p. ct. on main-pipes (£2681 4s. 11d.)		67	0 7			
10 p. ct. on meters and service-pipes (£745 5s. 0d.)		74	10 6			
				768	18 4	
Street-mains store (Poland Street)—						
4 p. ct. on buildings (£1586 7s. 2d.)		£63	9 1			
5 p. ct. on apparatus (£403 15s. 5d.)		20	3 9			
				83	12 10	
Street-mains—						
2½ per cent. on main-pipes (£221,198 3s. 8d.)				5,529	19 1	
Hired meters and fittings—						
10 per cent. on £33,137 8s. 11d.				3,313	14 10	
Meter-proving apparatus—						
10 per cent. on £71 4s. 9d.				7	2 5	
				22,849	4 5	
Stationery and advertising				548	16 2	
Law stationery, receipt, postage, and deed stamps, &c.				342	19 10	
Clothing for inspectors, &c.				252	9 6	
Subscriptions to Infirmary, Eye Hospital, &c.				84	14 0	
Miscellaneous expenses				669	2 2	
Bad debts				826	10 6	
Balance carried down				77,465	12 2	
				£355,681	3 10	
Interest on loans, &c. (less income-tax)				£18,861	13 3	
Amount transferred to capital account, towards liquidation of mortgage debt				28,977	9 6	
Surplus payable to the improvement department				29,626	9 5	
				£77,465	12 2	

By Gas-rental—					
Within the city—					
Private consumers	£210,683	9 3			
Meter-rents	4,413	3 4			
Public lamps	12,285	13 9			
			£227,382	6 4	
Beyond the city—					
Private consumers	£63,108	12 5			
Meter-rents	1,240	17 8			
Public lamps	4,268	16 2			
			68,618	6 3	
			£296,000	12 7	
Coke			38,761	12 11	
Tar			12,242	10 4	
Ammonia water			8,676	7 8	
			£355,681	3 10	
By balance brought down, being gross profit on the year's working			£77,465	12 2	
			£77,465	12 2	

General Summary of Receipts and Expenditure on Capital and Revenue Account, June 24, 1874.

Dr.				*Cr.*			
To Balance in the bank, June 24, 1873	£24,188 17 3			By Loans repaid		£58,585	6 0
Ditto in the treasurer's hands, June 24, 1873	134 3 6			Improvement and Chorlton-upon-Medlock Committees—			
Ditto of sums owing to and by the committee, including stocks on hand, June 24, 1873	68,688 4 10			Surplus for the year ending June 24, 1873	£16,600 13 11		
		£93,021	5 7	Advanced in anticipation of future profits	16,641 11 6		
Balance of profit and loss account, as per statement		29,626	9 5			33,242	5 5
Loans received		55,779	0 0	Expenditure on capital account, viz.—			
Materials sold (capital account) as per statement—				Gaythorn station	£2,447 12 1		
Gaythorn station	60 0 0			Rochdale Road ditto	12,184 15 7		
Rochdale Road station	158 0 0			Droylsden works	116 4 5		
Droylsden works	9 13 5			Street-mains	5,811 13 8		
		227	13 5	Service-pipes (one moiety)	1,180 19 11		
Amount transferred from revenue account—				Hired meters, &c.	5,699 9 0		
For depreciation of works		22,849	4 5			27,440	14 8
Liquidation of mortgage debt		28,977	9 6	Balance in the bank, June 24, 1874	£41,656 6 2		
Lower King Street station sold		7,500	0 0	Ditto in the treasurer's hands, June 24, 1874	196 5 6		
						41,852	11 8
				Ditto of sums owing to and by the committee, including stocks on hand, June 24, 1874		76,860	4 7
		£237,981	2 4			£237,981	2 4

Statement of Assets and Liabilities, June 24, 1874.

PERMANENT ASSETS.

Gaythorn station—				
Land, buildings, and apparatus, as per last report—				
Land	£60,467 16 10			
Buildings	73,273 13 11			
Apparatus	46,610 19 10			
		£180,352	10 7	
Less—				
Materials sold	60 0 0			
Depreciation	5,261 9 11			
		5,321	9 11	
		£175,031	0 8	
One year's outlay to June 24, 1874—				
Yard mains	£11 16 4			
New condensers	34 14 7			
New scrubbers, &c.	1,326 10 0			
Tar, &c., cisterns	589 8 10			
Boundary walls	485 2 4			
		2,447	12 1	
				177,478 12 9
Rochdale Road station—				
Land, buildings, and apparatus, as per last report—				
Land	£26,796 3 1			
Buildings	114,990 16 0			
Apparatus	65,694 9 1			
		£207,481	8 2	
Less—				
Materials sold	158 0 0			
Depreciation	7,884 7 0			
		8,042	7 0	
		£199,439	1 2	
One year's outlay to June 24, 1874—				
Land	£5,009 1 9			
Yard-mains	87 6 7			
New purifying-house	113 15 11			
New engine and exhauster house	493 8 3			
New cannel-stores	2,574 7 8			
New condensers	72 19 4			
New sulphur apparatus	79 6 6			
Revivifying shed and tar-well	1,275 6 1			
New meter-house	8 6 0			
No. 5 gasholder	1,763 3 4			
Newtown tanks	115 2 0			
Ditto gasholders	582 12 2			
River wall	10 0 0			
		12,184	15 7	
				211,623 16 9
Droylsden works—				
Buildings and apparatus, as per last report—				
Buildings	£6,792 12 0			
Apparatus	10,539 15 4			
		£17,332	7 4	
Less—				
Materials sold	9 13 5			
Depreciation	768 18 4			
		778	11 9	
		£16,553	15 7	
One year's outlay to June 24, 1874—				
Main-pipes	£29 14 4			
Service-pipes and hired meters	86 10 1			
		116	4 5	
				16,670 0 0
Bradford Road—				
Land purchased, as per last report				30,251 18 0
Street-mains store (Poland Street)—				
Land, buildings, and apparatus, as per last report—				
Land	£1,406 0 0			
Buildings	1,586 7 2			
Apparatus	403 15 5			
		£3,396	2 7	
Less—Depreciation		83	12 10	
				3,312 9 9
Street-mains—				
Main-pipes, as per last report	£221,198 3 8			
Less—Depreciation	5,529 19 1			
		£215,668	4 7	
One year's outlay to June 24, 1874		5,811	13 8	
				221,479 18 3
Service-pipes—				
Service-pipes laid, as per last report		£20,071	5 4	
Moiety of year's outlay charged to capital account		1,180	19 11	
				21,252 5 3
Hired meters, &c.—				
Outlay, as per last report	£33,137 8 11			
Less—				
Depreciation	3,813 14 10			
		£29,323	14 1	
One year's outlay to June 24, 1874		5,699	9 0	
				35,023 3 1
Meter-proving apparatus—				
Outlay, as per last report		£71	4 9	
Less—				
Depreciation		7	2 5	
				64 2 4
Total amount of permanent assets				£717,656 6 2

FLOATING ASSETS.

Cannel, retorts, and other materials on hand—			
Revenue account	£51,043 3 0		
Gas-rents, and sundry accounts due to the committee—			
Revenue account	62,856 11 8		
Extension ditto	1,507 5 3		
Amount paid in advance to the improvement department, in anticipation of future profits	32,126 8 8		
Balance in the bank	41,656 6 2		
Ditto in the treasurer's hands	196 5 6		
		209,391	0 3
		£927,047	6 5
Excess of assets, June 24, 1874		£399,284	16 8
Ditto of assets, June 24, 1873		370,307	7 2
Increase, being the amount charged upon the profit for the present year towards liquidation of mortgage debt, and carried to capital acct.		£28,977	9 6

LIABILITIES.

Mortgage debt—				
Act of 1844—1st charge	£30,146 0 9			
Ditto—2nd ditto	28,066 10 6			
Ditto of 1854	40,010 0 0			
Ditto of 1858	73,707 10 0			
Ditto of 1867	189,574 3 9			
Consolidated Stock	40,630 0 0			
Total amount secured by mortgage		£452,134	5 0	
Sums advanced, not secured by mortgage at this date—				
Indian Relief Fund Committee	4,000 0 0			
Admiral Duff's Charity	1,250 0 0			
Lamplighters fine-fund	180 0 0			
Eliza Ward	270 0 0			
	5,700 0 0			
				£457,834 5 0
Purchase of land, the purchase-money being left in the hands of the committee, at interest				1,750 0 0
Sundry accounts owing—				
Revenue account	£22,502 2 1			
Extension ditto	1,939 18 2			
				24,442 0 3
Deposits in hand				14,109 15 1
				£498,136 0 4
Surplus for the year ending June 24, 1874, payable to the improvement department				29,626 9 5
Balance, being excess of assets				399,284 16 8
				£927,047 6 5

[APPENDIX A.]

Statement of the Lamp and Private Rental (including Meter-Rents) derived from the Townships within and beyond the City respectively, for the Years 1872-73 *and* 1873-74.

	Half Year ending Dec. 25, 1872.			Half Year ending June 24, 1873.			Total for the Year 1872-73	Half Year ending Dec. 25, 1873.			Half Year ending June 24, 1874.			Total for the Yr. 1873-74.
	£ s. d.	£ s. d.		£ s. d.	£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.	£ s. d.		£ s. d.
Within the city—														
Township of Manchester—														
Private rental	61175 8 4			62925 15 9				62153 2 10			69294 17 1			
Public lamps	2799 8 7			3036 8 2				3345 19 10			3031 12 6			
		63974 16 11			65962 3 11				65499 2 8			72326 9 7		
Other townships—														
Private rental	37963 14 7			39558 9 3				39593 4 3			44055 8 5			
Public lamps	2215 5 5			2681 5 1				2704 0 6			3204 0 11			
		40179 0 0			42219 14 4				42297 4 9			47259 9 4		
Total within the city		104153 16 11			108181 18 3		212335 15 2		107796 7 5			119585 18 11		227382 6 4
Beyond the city—														
Private rental	26646 12 6			27035 9 7				28725 1 5			31938 15 4			
Public lamps	1721 13 0			1771 11 0				1801 14 5			2248 17 8			
Total beyond the city		28368 5 6			28807 0 7		57175 6 1		30526 15 10			34187 13 0		64714 8 10
Gross rental		132522 2 5			136988 18 10		269511 1 3		138323 3 3			153773 11 11		292096 15 2
Add Droylsden							3249 6 7							3903 17 5
Total							£272760 7 10							£296000 12 7

Within the city: Gross rental (1872-73) £212,335 15s. 2d.; ditto (1873-74) £227,382 6s. 4d.; increase, £15,046 11s. 2d. Beyond the city: Gross rental (1872-73) £57,175 6s. 1d.; ditto (1873-74) £64,714 8s. 10d.; increase £7539 2s. 9d. Droylsden: Gross rental (1872-73) £3249 6s. 7d.; ditto (1873-74) £3903 17s. 5d.; increase, £654 10s. 10d. Total: Gross rental (1872-73) £272,760 7s. 10d.; ditto (1873-74) £296,000 12s. 7d.; increase, £23,240 4s. 9d.

[APPENDIX B.]

Comparative Statement of the Quantity of Gas transmitted from the Works, in the Day-time and during the Twenty-four Hours, for the Years 1872-73 *and* 1873-74.

	Day-time.				Twenty-four Hours.			
	1872-73.	1873-74.	Increase.	Decrease.	1872-73.	1873-74.	Increase.	Decrease.
	Cubic Feet.	Cubic Feet.	Per cent.	Per cent.	Cubic Feet.	Cubic Feet.	Per cent.	Per cent.
July	18,018,000	16,761,000	....	6·97	72,225,000	70,154,000	....	2·86
August	18,353,000	18,746,000	2·14	....	85,347,000	87,859,000	2·96	....
September	21,995,000	22,526,000	2·41	....	113,861,000	117,920,000	3·5	....
October	34,448,000	29,405,000	....	14·63	179,740,000	172,573,000	....	3·98
November	36,625,000	34,088,000	....	6·92	219,018,000	215,746,000	....	1·49
December	45,666,000	44,078,000	....	3·47	247,348,000	250,762,000	1·38	....
January	40,256,000	40,183,000	....	0·18	234,479,000	234,982,000	0·21	....
February	37,172,000	33,869,000	....	8·88	190,228,000	186,637,000	....	1·88
March	29,641,000	27,499,000	....	7·22	155,374,000	156,091,000	0·46	....
April	21,370,000	19,523,000	....	8·64	107,901,000	107,215,000	....	0·63
May	22,139,000	19,766,000	....	10·71	90,804,000	90,267,000	....	0·59
June	16,833,000	16,866,000	·19	....	66,822,000	66,469,000	....	0·52
	342,516,000	323,310,000	....	....	1,763,147,000	1,756,675,000	....	0·36
Add Droylsden	..	..	....	....	19,537,000	21,782,000	11·49	....
Total	..	..	....	5·60	1,782,684,000	1,778,457,000	....	0·23

During the day-time (1872-73) 342,516,000 cubic feet; (1873-74) 323,310,000 cubic feet; decrease, 19,206,000 cubic feet. During the twenty-four hours (1872-73) 1,782,684,000 cubic feet; (1873-74) 1,778,457,000 cubic feet; decrease, 4,227,000 cubic feet.

[APPENDIX C.]

Table showing the Number of each Size of Meter in use on the 24th of June, 1873 *and* 1874 *respectively,*

Size of Meters.	Townships within the City.														Townships beyond the City.		Total.		Increase.	Decrease
	Manchester.		Chorlton-u.-Medlock.		Hulme.		Ardwick.		Beswick.		Cheetham.		Total within the City.							
	1873.	1874.	1873.	1874.	1873.	1874.	1873.	1874.	1873.	1874.	1873.	1874.	1873.	1874.	1873.	1874.	1873.	1874.	1874.	1874.
1 light	45	38	17	17	15	10	13	8	..	..	..	..	90	73	4	4	94	77	..	17
2 lights	11427	11428	3623	3641	6659	6663	2465	2500	383	435	1572	1577	26129	26244	8290	8419	34419	34663	244	..
3 ,,	3980	4000	2309	2448	2216	2218	704	730	65	79	1134	1197	10408	10672	3142	3445	13550	14117	567	..
5 ,,	2653	2705	1566	1633	686	702	324	330	31	34	830	859	6090	6263	2414	2669	8504	8932	428	..
10 ,,	1546	1583	467	488	200	214	123	127	7	9	255	235	2598	2656	895	1022	3493	3678	185	..
20 ,,	880	924	116	127	76	88	43	45	1	2	57	59	1173	1245	307	340	1480	1585	105	..
30 ,,	363	387	36	40	32	26	9	8	3	2	23	26	466	489	117	120	583	609	26	..
45 ,,	37	33	4	4	2	2	3	2	..	..	..	..	46	41	9	9	55	50	..	5
50 ,,	233	269	20	20	13	12	4	10	2	2	15	14	287	327	54	58	341	385	44	..
60 ,,	106	113	6	7	15	16	7	1	..	..	7	7	141	144	16	13	157	157	..	..
80 ,,	87	96	9	9	9	10	3	4	..	..	1	1	109	120	16	18	125	138	13	..
100 ,,	135	154	10	10	9	10	7	4	1	1	7	6	169	185	31	34	200	219	19	..
150 ,,	44	48	6	5	7	7	2	4	..	..	2	2	61	66	11	14	72	80	8	..
200 ,,	18	21	..	3	1	2	1	2	..	..	3	3	23	31	11	11	34	42	8	..
250 ,,	5	4	..	..	..	..	2	..	1	1	..	..	8	5	..	1	8	6	..	2
300 ,,	18	17	2	4	2	2	..	..	..	..	3	3	25	26	9	9	34	35	1	..
500 ,,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	1	..	..
600 ,,	3	3	..	..	..	..	..	..	..	..	..	..	3	3	..	..	3	3	..	..
1000 ,,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	1	..	..
Total	21580	21823	8191	8456	9942	9982	3710	3775	494	565	3909	3989	47826	48590	15328	16188	63154	64778	1648	24

Add Droylsden, 1201; total meters, 65,979. Add Droylsden increase, 62; total increase, 1710. Deduct decrease, 24; net increase, 1686 meters.

Statement showing the Number and Size of Meters on Hire on June 24, 1874 *(included in the above Table).*

	1 Light.	2 Lights.	3 Lights.	5 Lights.	10 Lights.	20 Lights.	30 Lights.	50 Lights.	60 Lights.	80 Lights.	100 Lights.	150 Lights.	Total, 1873.	Total, 1874.	Increase. 1874.
Within the city	71	13050	4584	2066	524	139	37	16	16	3	11	1	19295	20518	1223
Beyond the city	4	2926	1483	1051	165	15	6	1	2	2	1	..	5004	5656	652
Total	75	15976	6067	3117	689	154	43	17	18	5	12	1	24299	26174	1875

[APPENDIX D.]

Main Pipes Laid and Taken up during the Year ending June 24, 1874.

Laid.	Diam. 2 in.	Diam. 3 in.	Diam. 4 in.	Diam. 5 in.	Diam. 6 in.	Diam. 8 in.	Diam. 9 in.	Diam. 12 in.	Diam. 15 in.	Diam. 18 in.	Total Length.
	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.
Townships within the city—											
Manchester	5136	1343	1476	..	1236	90	36	261	137	370	10085
Chorlton-upon-Medlock	1844	451	34	..	22	..	..	104	..	..	2455
Hulme	743	55	168	..	351	..	..	..	..	..	1317
Cheetham	282	107	284	..	..	..	..	..	..	..	673
Ardwick	893	10	195	..	6	..	..	..	..	..	1104
Beswick	845	..	67	..	..	..	..	..	..	..	912
	9743	1966	2224	..	1615	90	36	365	137	370	16546
Townships beyond the city	8717	2268	400	..	954	..	..	8	260	..	12607
Total	18460	4234	2624	..	2569	90	36	373	397	370	29153
Taken up.											
Townships within the city	899	1893	579	258	361	..	282	..	..	..	4272
Townships beyond the city	..	832	38	9	..	..	..	239	..	..	1118
Total	899	2725	617	267	361	..	282	239	..	..	5390

Net increase during the year, 23,763 yards.

[APPENDIX D—*continued.*]

Summary.

	Diam. 2 in.	Diam. 3 in.	Diam. 4 in.	Diam. 5 in.	Diam. 6 in.	Diam. 7 in.	Diam. 8 in.	Diam. 9 in.	Diam. 10 in.	Diam. 11 in.	Diam. 12 in.	Diam. 13 in.	Diam. 14 in.	Diam. 15 in.	Diam. 16 in.	Diam. 18 in.	Diam. 20 in.	Diam. 22 in.	Diam. 24 in.	Diam. 30 in.	Total Length
Pipes laid to June 24, 1873—	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.	Yds.
Within the city	232129	123224	48572	15268	29846	738	14700	13721	1438	353	28711	309	7213	4792	4043	5258	324	477	6782	2520	540418
Beyond the city	117037	54880	50487	6630	28713	410	24989	13517	1327	1808	20501	..	749	45	..	4031	..	..	315	..	325439
Pipes laid during the year ending June 24, 1874—	349166	178104	99059	21898	58559	1148	39689	27238	2765	2161	49212	309	7962	4837	4043	9289	324	477	7097	2520	865857
Within the city	9743	1966	2224	..	1615	..	90	36	..	..	365	..	..	137	..	370	..	..	..	..	16546
Beyond the city	8717	2268	400	..	954	..	..	..	..	..	8	..	..	260	..	..	..	..	..	..	12607
	367626	182338	101683	21898	61128	1148	39779	27274	2765	2161	49585	309	7962	5234	4043	9659	324	477	7097	2520	895010
Deduct pipes taken up	899	2725	617	267	361	..	..	282	..	..	239	..	..	..	..	..	..	..	..	..	5390
Total	366727	179613	101066	21631	60767	1148	39779	26992	2765	2161	49346	309	7962	5234	4043	9659	324	477	7097	2520	889620

Total, 505¼ miles and 380 yards.

[APPENDIX E.]

Statement showing the Amount of Gross Profit, and the Mode of its Appropriation; also the Amount of Borrowed Money Owing, and the Excess of Assets, &c., from the Year 1862 to the present Date.

Year ending June 24.	Profits.	Maximum Price of Gas, per 1000 Feet, within the City.	Appropriation of Gross Profits.			Amount advanced to Improvmnt. Commte. in anticip'tion of future Profits.	Paid over for Improvement Purposes.	Retained tow'rds Repayment of Advances made to the Improvmnt. Committee in anticipation of future Profits.	Balance owing of Amounts advanced in anticip'tion of future Profits.	Borrowed Money Owing.	Amount charged to Revenue in respect of Depreciation of Works and Mains.	Excess of Assets.
			Interest.	Liquidation of Mortgage Debt.	Surplus.							
	£ s. d.	s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1862	42667 7 1	4 0	15482 3 2	19330 14 4	7854 9 7	....	7854 9 7	....	....	382539 7 10	12179 4 11	126591 4 6
1863	55804 12 9	Half year 4 0; " 3 9	14932 17 8	18609 17 4	22261 17 9	....	22261 17 9	....	....	362877 8 10	12666 18 11	145201 1 10
1864	59545 18 9	Half year 3 9; " 3 6	13888 12 10	17810 1 0	27847 4 11	....	27847 4 11	....	....	335808 16 9	12690 12 9	163011 2 10
1865	56432 4 5	Half year 3 6; " 3 2	13086 10 9	17387 0 11	25758 12 9	....	25758 12 9	....	....	306931 2 2	13050 6 6	180598 3 9
1866	52553 2 10	3 2	13252 13 0	19784 2 0	19516 7 10	....	19516 7 10	....	....	347472 2 11	13817 2 9	200382 5 9
1867	47323 0 4	3 2	14167 11 7	19898 0 4	13257 8 5	....	13257 8 5	....	....	331725 9 7	14628 8 6	220280 6 1
1868	49546 4 7	3 2	14314 17 9	20246 0 5	14985 6 5	13059 8 5	28044 14 10	....	....	351035 10 4	15173 2 5	239685 15 6
1869	52736 18 4	3 2	15467 12 6	22688 14 4	14580 11 6	11303 19 8	25884 11 2	....	24363 8 1	395469 8 5	15387 15 7	262374 9 10
1870	65343 10 8	3 2	16784 13 8	24487 6 0	24071 11 0	3750 0 0	27821 11 0	....	28113 8 1	432941 1 9	17633 5 10	286861 15 10
1871	79322 9 5	3 2	18329 0 5	27050 15 11	33942 13 1	....	28020 11 11	5922 1 2	22191 6 11	448593 9 5	19602 10 5	313912 11 9
1872	63257 9 7	3 2	18539 19 6	27805 15 11	16911 14 2	13293 10 3	30205 4 5	....	35484 17 2	459593 9 5	22283 6 8	341718 7 8
1873	63603 0 6	One Qr. 3 2; Three " 3 4	18413 7 1	28588 19 6	16600 13 11	16641 11 6	33242 5 5	....	52126 8 8	460640 11 0	22614 18 6	370307 7 2
1874	77465 12 2	Half Year 3 4; " 3 8	18861 13 3	28977 9 6	29626 9 5	183 9 4	29809 18 9	....	52309 18 0	457834 5 0	22849 4 5	399284 16 8
Total.	765601 11 5	....	205521 13 2	292864 17 6	267135 0 9	58231 19 2	319524 18 9	....	....	....	214576 18 2	....

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND NORTH DERBYSHIRE.

(FROM OUR OWN CORRESPONDENT.)

The iron trade does not alter much from week to week just at this time of the year, but I may state that in several branches of trade there is not that amount of activity which is usually associated with the two or three months preceding Christmas.

Most of the larger foundry establishments are producing a very good tonnage of castings of most kinds, Staveley being still well employed on large and small diameter gas and water pipes.

There is a somewhat quieter inquiry for foundry and forge pig iron, and prices have in consequence given way a little. A good local forge quality can be had at about 63s. to 70s. per ton. Cleveland general makers brands are held at about these figures:—No. 1 foundry, 70s. to 71s.; No. 2 foundry, 68s. to 69s.; No. 3 foundry, 66s. to 66s.; No. 4 foundry, 61s. to 62s.; No. 4 forge, grey, 57s. 6d.; No. 5 forge, mottled, 56s.; No. 6 forge, white, 55s.; refined metal, 79s.; Kentledge, 67s.; and cinder pig, 47s. to 47s. 6d. per ton for net cash.

Scotch pig is in very sparse supply, and is a shilling or two dearer on the week; stocks in store at Glasgow being excessively small—only, in fact, 17,000 tons.

The Rotherham Brass-Works are still busily employed, and appear likely to be quite as busy during the whole of the coming winter. The demand is for engine brasses, meters, hydrants, and all kinds of gas and water brass fittings.

Very much to the surprise of even people in the trade, the South Yorkshire Coalowners Association met last week at Sheffield, and decided to increase the price of coal by 1s. per ton from the 2nd of November. Many of the colliery proprietors in North-East Derbyshire have taken the same step; but in neither instance is it sought to establish the advance on slack coal for which the market is at present extremely limited. All other kinds of coal are thus raised, and it is stated that many of the coalowners have so firm a belief that prices will still further go up as the season advances, that they are declining to bind themselves by contracts extending over more than a very limited period. Best Silkstone main coal is about 15s. to 16s.; best Barnsley, 14s. to 14s. 6d.; seconds house coal, 13s. to 13s. 6d.; and engine slack, 4s. to 8s. per ton at the pits. There is a very good business doing in house coal with the metropolis, and a steadily large tonnage of steam coal is being despatched from South Yorkshire, Kiveton Park, Shireoaks, &c., to Hull, Goole, and Grimsby, for shipment to continental ports. Steam coal is quoted at about 12s. to 14s. per ton at several of the pits.

IRON AND COAL TRADES OF SOUTH STAFFORDSHIRE AND EAST WORCESTERSHIRE.

(FROM OUR OWN CORRESPONDENT.)

The demand for finished iron is again languid in most descriptions, and makers of common qualities seem inclined to make some little concession in price to tempt buyers, rather than restrict the production of their works, for though all the mills are now in full operation it is quite evident that the orders coming in do not at all keep face with the "output" of the works, and that unless an improved demand is experienced many of the mills will only be kept running half time.

Branded iron is steady at £10 10s. to £11 for bars, and £13 to £14 for sheets of ordinary quality. Makers of the best brands of bars are busy, and there is a fair demand for thin sheets of good quality for galvanized roofing purposes.

Pig iron is in moderate request, owing to the lowness of stocks, and the restricted production and prices are maintained at £3 5s. for cinder pig, £5 to £5 10s. for hot-blast native all-mine. The production of pig iron in this district is at present far below the requirements, and a good quantity is being imported from other markets. The leading iron foundries are in well-sustained activity, and some good orders for gas and water mains and mill and forge castings are now in course of execution.

The demand for wrought tubes and fittings is slowly recovering, but the condition of the trade is far from satisfactory, and the prospects of business are likely to be further complicated by a labour dispute, as the operatives have intimated their intention to resist the proposed reduction of 10 per cent. in the wages, and all the men at one of the leading firms at Wednesbury are already out on strike.

The demand for coal is improving daily, though large stocks of fuel are still held at some of the collieries. This is especially noticeable with regard to fine slack, for which there appears to be no market just now. The colliers are working more steadily than they have done for some time past, though there is again some little dissatisfaction amongst them with reference to the proposed alterations in the hours of labour. It is intended that through the winter work shall commence at seven a.m., instead of six as formerly, in order to effect a saving of the large quantities of fuel required to light the collieries at that early hour; but the men regard the alteration with some apprehension as a prelude to further interference with the hours of work. Prices amongst the non-associated masters are very irregular, and large quantities of fuel may now be purchased on very easy terms. Coke is without notable change since last report.

THE COAL AND IRON TRADES OF LANCASHIRE.

(FROM OUR OWN CORRESPONDENT.)

The position of the coal trade in this district remains without much change since my last report. For all classes of fuel there has been a very brisk demand, the colliery proprietors in the Manchester district receiving far more orders than they can attend to; and although the list rates remain unchanged, prices generally have a stiffening tendency. For gas coal and cannel there has been an active inquiry, some good sales of the latter description having been made during the past week in the Manchester district at prices ranging from 20s. to 22s. 6d. per ton for ordinary unpicked cannel at the pit mouth. For gas coal—of which, however, there is not much offering in the market—prices run from 10s. to 12s. per ton for unscreened, to 12s. and 14s. per ton for screened, according to the nature of the order.

From the outside districts there has been an excessive demand for house coal, and a good inquiry for all classes of steam fuel, a very good trade being done from the pits to the districts which are affected by the West Lancashire strike.

In the shipping trade a considerable business has been done in coal for gas-making purposes, several important orders having been received from American ports. In other descriptions of fuel, however, there is still very little doing, as local wants require all the present get, and Welsh collieries are now to a large extent supplying the shipping requirements for steam fuel.

The coke trade continues rather dull, but prices are maintained. Yorkshire and north country makes have been offering at rather low prices, but supplies from this quarter are only of a temporary nature, owing to the present slackness in the iron trade.

The strike in the West Lancashire districts appears to be gradually approaching the end. The masters have maintained a firm attitude, but many of the men have returned to the pits—in the St. Helen's districts this being especially the case—and it is expected that another week will see the dispute practically at an end.

In the iron trade, although reports are rather various, there has scarcely been so much doing during the past week, and business may be regarded as quiet, although perhaps not more than ordinarily so for this season of the year. The slackness in the rail trade has had a depressing effect upon Middlesborough forge iron, and Cleveland pig iron has been offering at very low prices. Lanca-

shire makes delivered are quoted at about 75s. for No. 3 foundry, and about 70s. per ton for forge qualities. There has been a tolerably fair inquiry for prompt delivery, but to secure running contracts, extending over the next six months or so, concessions on the present market rates have to be made. In manufactured iron there is not much change to notice, bars of ordinary makes being quoted at about £9 10s.; good brands about £10; light rails, £8 10s.; and heavy about £7 10s. per ton delivered.

The forges and blast furnaces continue tolerably well employed throughout this district.

THE COAL AND GENERAL TRADE OF THE NORTH OF ENGLAND.
(FROM OUR OWN CORRESPONDENT.)

There has been a good deal of activity shown in the shipment of gas coals, especially from the Tyne Dock, within the past ten days. The leading collieries in the trade are not able to arrange for shipment of coals under a less term than ten days, and the dock is very much crowded with vessels of all sorts, the greater portion of which are freighted to load gas coals. The inquiry has not only shown itself in an improved demand for the best sorts, but orders have come into the market for second qualities, and the general tone of the trade has improved with stiffer prices. At present there is some difficulty in getting coals away to the smaller ports of the east coast and the British Channel through a scarcity of the lesser class of sailing vessels, and freights have improved to the extent of something like 1s. per ton. Household coals have likewise been in good demand for the coast, but there is little inquiry for steam coals. The steam coal trade is becoming more depressed, and with the little local inquiry that there is for small steam and manufacturing coals, it is difficult to see how the present quoted rules for steam coals can be sustained. Mr. Russell Gurney, Q.C., the Recorder of London, who was appointed umpire in the arbitration upon wages in the county of Durham, has given his award, the result of which is that there shall be a reduction of 9½ per cent. upon the wages now earned by the Durham pitmen. This decision seems to be satisfactory to both masters and men, and no doubt will be loyally observed.

In the iron trade of the North of England business is undoubtedly quieter. There is less desire to buy pig iron for forward delivery. At Middlesborough, No. 1. is selling at 70s. net cash; No. 3, 65s. cash; and forge at from 57s. 6d. to 58s. 6d. cash. The rail trade, which is the staple of the district, is in an unsatisfactory condition at present. Some of the largest mills are closed, while others are put on short time because it is found impossible to secure orders at a remunerative rate. Bar and plate manufacturers are well employed.

The chemical trade of the northern district slightly improved last week, and there were increased shipments, especially of soda ash and crystals of soda, to the Continent. But this trade does not show very many active symptoms of a revival. As the present rates are barely remunerative, makers show very little inclination to take orders, and decline to enter into contracts for next year at the present prices. The general state of manufacturing business in the Tyneside district is dull. There is no animation at all. Speculation of all sorts is carefully avoided, and there is no attempt at extension of business anywhere. There are very heavy stocks of timber held in this district, and on account of the reaction in trade, merchants are beginning to realize their stock, many of them undoubtedly at a considerable loss. Deals have fallen fully £2 per standard, and all other sorts of timber tend downward in price. Building material generally is feeling the depression, and there is a growing opinion that the wages of skilled workmen will have to be reduced before long.

HULL GAS SUPPLY.—Mr. Baynes reports that the gas sent into the Sculcoates and Myton district during October by the British Gas Company was of fair illuminating power, except on the 21st and 22nd of the month, when it was down to about 14 candles; there was the usual absence of free ammonia and sulphuretted hydrogen. The results for the month are:—

	Max.	Min.	Mean.
Illuminating power standard sperm candles	16·42	14·20	15·80
Grains of sulphur per 100 feet	28·00	24·00	26·50
Grains of ammonia per 100 feet . . .	—	—	·30

Mean barometer and temperature in experiment-room:—Bar., 29·95; tem., 62°.

HULL WATER-WORKS.—The income of the Hull Corporation Water-Works for the past year has been £22,867 13s. 8d., and the expenditure £30,878 4s. 8d.; the excess of expenditure over income being £8010 11s. There was a similar loss on the works in the previous year. Last year's loss included £2259 8s. 5d. in connexion with a break-down of the engines, and there is a sum of about £4000 still to be met under that head, and outstanding accounts amounting to £2830; so that the actual loss on the works for the closed year is £1400 or £1500. Recently there were several dismissals in connexion with the works, and a new committee chosen, and the corporation look for an alteration of the recent ruinous state of affairs.

THE INSTITUTION OF CIVIL ENGINEERS.—The first ordinary meeting of the fifty-eighth session of this scientific society will be held this evening, when questions of rainfall, of flow from the ground, and of evaporation in India and in other places, will form the subjects of discussion, founded on a paper then to be read, descriptive of the Nágpúr Water-Works, by Mr. Alex. R. Binnie, M. Inst. C.E. The members have been urged to continue to exert themselves to maintain the character of the Institution by presenting careful and complete memoirs suited for discussion, as well as shorter papers or notes on various professional topics for record in the transactions, and also abstracts of some of the more important essays printed by analogous societies abroad, and in foreign engineering and technical journals.

Register of New Patents.

APPLICATIONS FOR LETTERS PATENT.

3751.—MACKAY, G., Edinburgh, "An improved process of purifying liquids and recovering matter contained therein." Oct. 30, 1874.

3778.—TURTON, S., JOLLEY, W., and BIRCHALL, J. T., Heaton Norris, Lancs, "Improvements in diminishing valves or apparatus for regulating the pressure of liquids and fluids." Nov. 2, 1874.

3782.—NEWTON, A. V., Chancery Lane, London, "Improvements in means for lighting illuminating gas and in fulminating compounds applicable thereto, and for other purposes." A communication. Nov. 2, 1874.

3784.—VALLÉ, B. H., Stow-on-the-Wold, Gloucester, "Improvements in the treatment and utilization of sewage and in means employed therein." Nov. 3, 1874.

3792.—FOGARTY, T. B., Warren, Massachusetts, U.S.A., "Improved apparatus for carburetting air or other gaseous bodies." Nov. 3, 1874.

3804.—DIXON, A., Howard Road, Penge, Surrey, "Improvements in test, try, or gauge cocks for ascertaining the height or level of water or other liquids, or of steam in steam or other boilers or vessels." Nov. 4, 1874.

3807.—JOHNSON, J. H., Lincoln's Inn Fields, London, "Improvements in apparatus for drawing or raising water or other liquids." A communication. Nov. 4, 1874.

GRANTS OF PROVISIONAL PROTECTION.

3611.—LACK, P. J., Westmoreland Place, London, "Improvements in valves for regulating the supply of gas, and in other fittings connected with gas-burners." Oct. 20, 1874.

3661.—HOOKER, W. D., St. Julian's Road, and BROWNE, S. G., Cavendish Road, Kilburn, London, "Improvements in steam-engines and steam-regulators attached thereto, also in pumps and pump-valves worked by said engine." Oct. 23, 1874.

3672.—GREENACRE, T., Turner's Road, Burdett Road, London, "Improvements in means or apparatus for manufacturing screws of vulcanite or other analogous material for liquid-meters." Oct. 24, 1874.

3687.—HOLMAN, S., Laurence Pountney Lane, London, "Improvements in apparatus used in the manufacture of gas." Oct. 26, 1874.

3699.—HAMBLETON, F. H., Baltimore, U.S.A., "Improvements in apparatus to admit of the continuous running of a pump or other apparatus supplying fluid through pipes when the flow through the pipes is for a time wholly or in part arrested, without injury to the pipes and without waste of fluid." A communication. Oct. 26, 1874.

3719.—PAGET, F. A., Seymour Chambers, Adelphi, London, and Riemer Gasse Stadt, Vienna, "Improvements in centrifugal pumps for raising and forcing liquids, and in centrifugal pumps or fans for exhausting and blowing gases." A communication. Oct. 27, 1874.

NOTICES TO PROCEED.

2952.—LOTZ, W. F., Carter Lane, St. Paul's, London, "Improvements in the method of and means of suspending chandeliers for gas or other lights, and adjusting them to the required height." A communication. Aug. 29, 1874.

3487.—FOULIS, W., Glasgow, "Improvements in charging and drawing retorts, and in the machinery or apparatus employed therefor." Oct. 10, 1874.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

1584.—SUGG, W. T., Vincent Street, Westminster, "Improvements in apparatus for regulating the supply of gas." May 5, 1874.

1589.—LENOIR, F., Paris, France, "Improved apparatus for carburetting gas." May 5, 1874.

Notes and Queries.

G. G. would feel much obliged if any of the readers of the JOURNAL could give him an idea of the number of ordinary street gas-lamps within a radius of four miles round Charing Cross, the lighting for which the parishes pay.

Meter-Tester.—It is immaterial whether gas or air be employed in testing a gas-meter, and we do not understand why a meter should be rejected by an inspector who uses air, and approved by another who employs gas.

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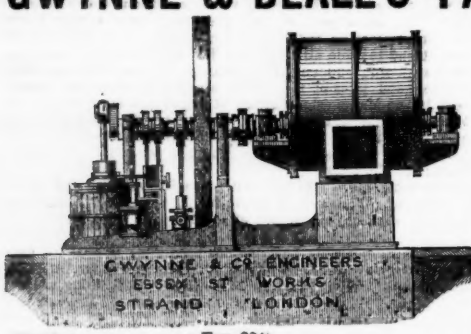

FIG. 224.

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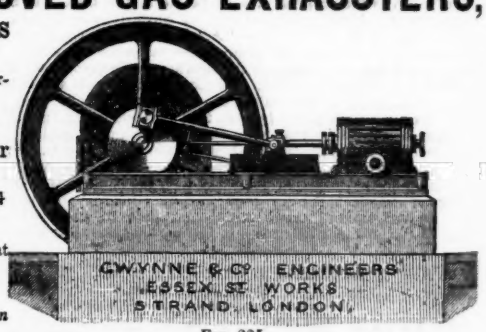

FIG. 225.

Fig. 224 represents one of those erected at the Imperial Gas-Works, Bromley, capable of passing 210,000 cubic feet of gas per hour. Several others of the same size are now on order for the same Company. These Patent Machines combine the highest quality of workmanship and materials, the largest bearings and wearing surfaces, with the **most perfect system of action yet discovered.** Fig. 225 represents one of a series of four at the Nottingham Gas-Works, each passing 52,500 cubic feet per hour. GWYNNE AND Co. *do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, but to produce Machinery of the very highest quality, and the most approved design and arrangement.* Their prices have been estimated with a due regard to the **excellence of the article produced,** and when this is taken into consideration, they have no fear for the result. The orders executed this season for Exhausters and alterations to their patented system amount to over 4,000,000 cubic feet of gas passed per hour, and to over 300 horse power for Engines to drive them. In every instance their work is giving the greatest satisfaction. Numerous testimonials and references can be given.

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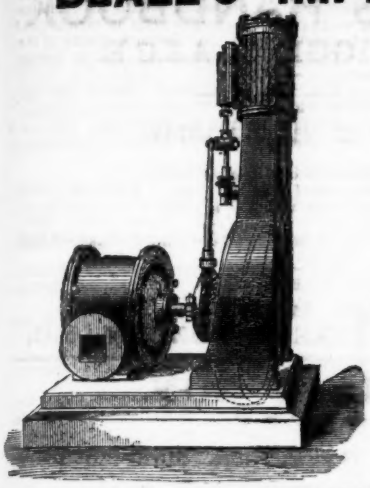
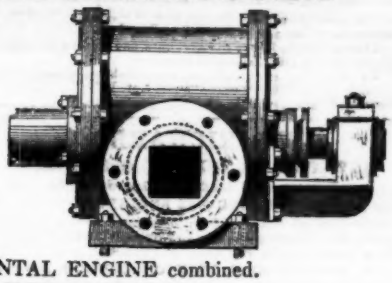


WITH

ENGINE COMBINED

ON

ONE BASE PLATE.



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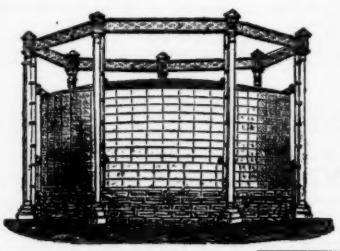

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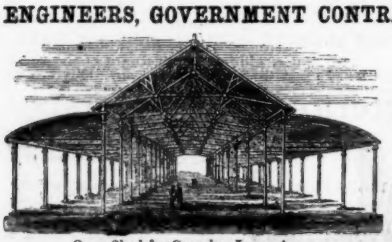

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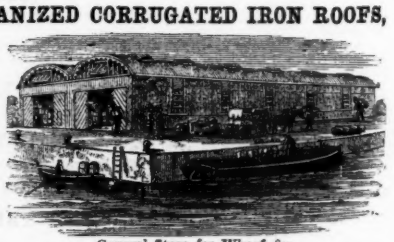

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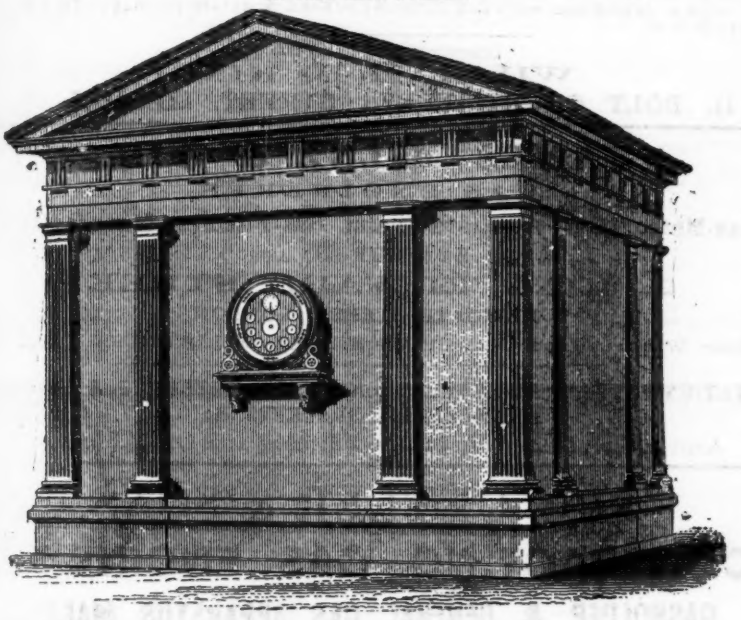

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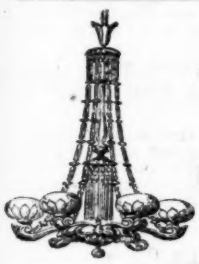

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LAMP REGULATOR

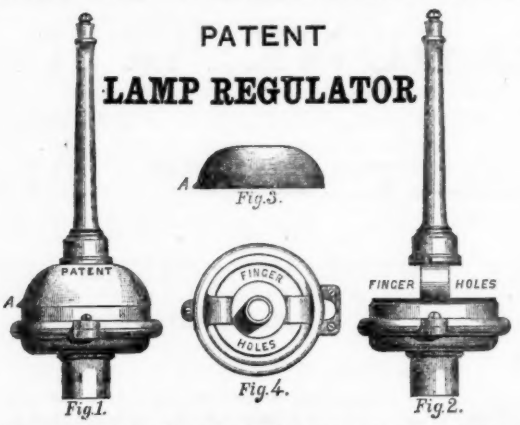

Fig.1. *Fig.3.* *Fig.4.* *Fig.2.*

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PATENTEES OF
GAS REGULATORS FOR PUBLIC LAMPS, FACTORIES, PUBLIC HALLS, AND DWELLING-HOUSES.

Attention is respectfully requested to the following extract from a lecture "On the Economical Combustion of Coal Gas," delivered to the Philosophical Society of Glasgow, by Dr. W. Wallace, F.R.S.E., F.C.S., Gas Examiner for the city of Glasgow, on the 4th of March last:—
"A few years ago, a simple form of Gas Regulator for Street Lamps was introduced, I do not know by whom, and various forms of it, and improvements on it, have been made by many practical gas engineers. Of all the modifications of the instrument, the best in my opinion is that of Mr. D. Bruce Peebles, of Edinburgh; in fact, his Lamp Regulators are so superior that they are likely to supplant all others. Already about 9000 of these have been applied to the street-lamps in Glasgow, and I understand it is the intention of the authorities to introduce them all over the town. The saving thereby effected I calculate to be about £6000 per annum, without any diminution of light. One of the great advantages of Mr. Peebles's apparatus over all others is that it can be regulated while the gas is burning."
Since the above date, another 1000 have been supplied to Glasgow, and they are being largely adopted at home and abroad.

D. B. P. and Co. are prepared to Estimate for the Supply and Maintenance of their Regulators, and will be glad to forward terms on application.

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BY
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This Cannel produces in actual working, in iron retorts, 9200 cubic feet of 32-candle gas, and upwards of 11 cwt. of coke, and in clay retorts will produce 11,500 cubic feet of 25·9-candle gas.

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Yields 11,600 cubic feet of 34·3-candle gas per ton, and 10 cwts. of excellent coke, containing only 5 per cent. of ash.

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STRONGLY RECOMMEND A TRIAL OF THEIR

CELEBRATED SILKSTONE GAS NUTS.

Analysis by F. J. EVANS, Esq., Chartered Gas Company, Horseferry Road, Westminster:—

(COPY.)

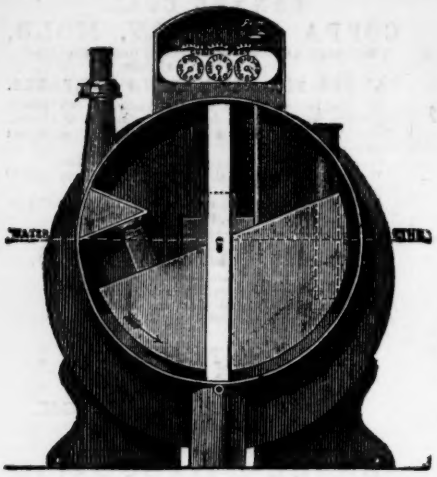
	Cubic Feet of Gas per Ton of Coal.	Illuminating Power in Candles.	Coke per Ton of Coal used.	Ash in Coke, per Cent.	Sulphur in Coal, per Cent.
Silkstone Nuts . . .	10·800	15·85	12·66 cwt.....	6·0	0·69

NOTE.—The illuminating power of the gas was tested by the standard burner now used in London by the Gas Referees, under the City of London Gas Act, 1868.

Horseferry Road, Westminster, March, 1870. (Signed) F. J. EVANS.

These Nuts are extensively used by various Gas Companies throughout the Kingdom, who bear strong testimony to their value.

APPLICATIONS FOR PRICES, &c., TO BE SENT DIRECT TO THE COLLIERY, AS ABOVE.



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Over 90,000 in action.

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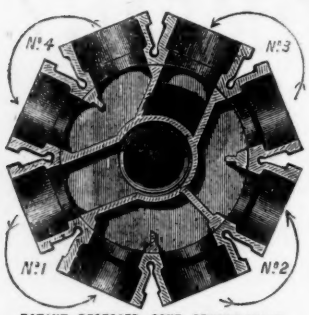

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Sectional Plan.

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Constructed on the principle of the ordinary Plug-Cock.

THROUGH-WAY & FOUR-WAY COCKS

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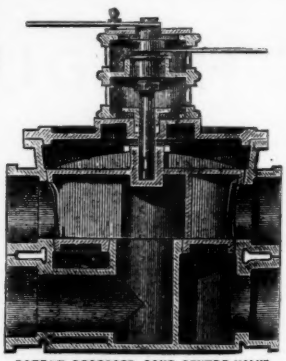
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GAS-STOVES, and every article connected with Gas Apparatus.

CAST & WROUGHT IRON PIPE, BLACK & GALVANIZED. COPPER, TIN, BRASS, & COMPOSITION TUBING.

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Boyle's Patent Silvered Glass Combination Reflectors and Outside Lanterns.

Sole Manufacturers of Church and Mann's Photometer.

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